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# PAPER TRADE JOURNAL

Vol. XCVII DECEMBER 21, 1933 No. 25

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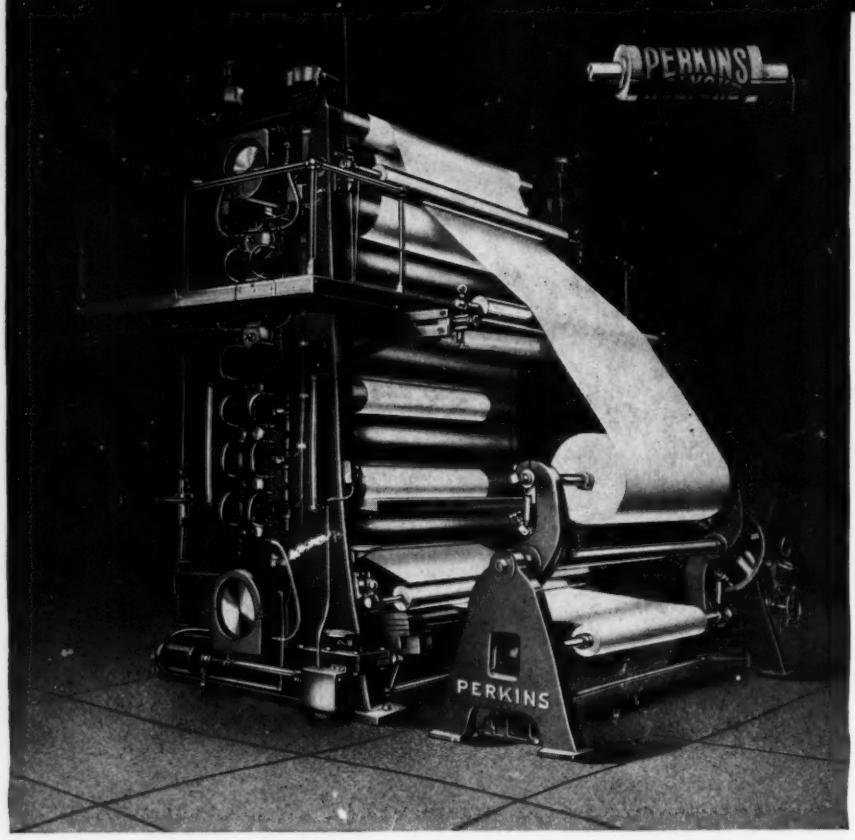


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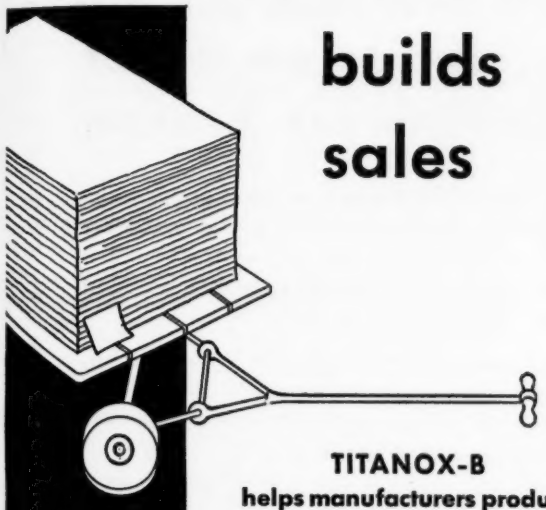

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# PAPER TRADE JOURNAL

ESTABLISHED 1872

SIXTY-SECOND YEAR

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

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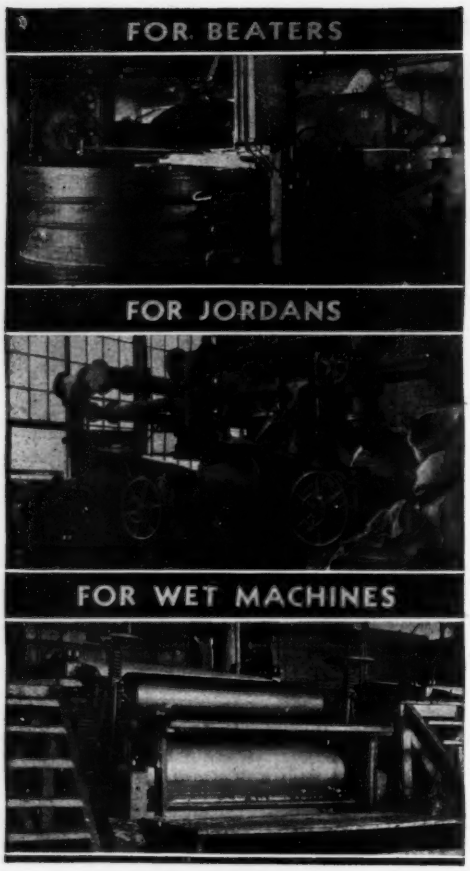


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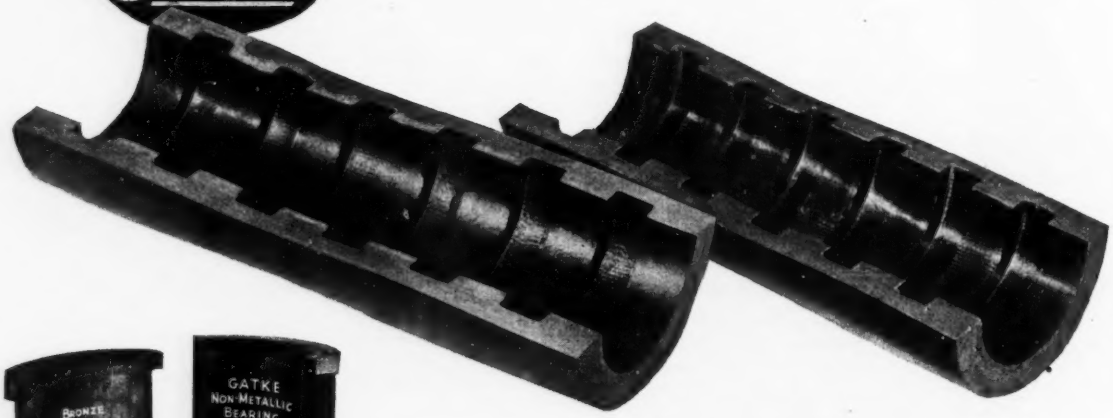

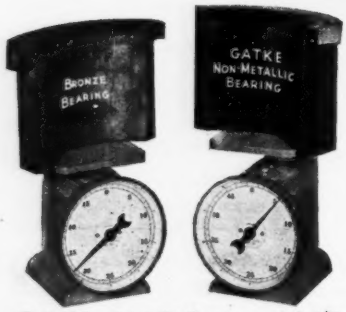


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PAPER TRADE JOURNAL

With Which Is Combined

PAPER

Vol. XCVII, No. 25 Thursday, December 21, 1933

# Treasury to Aid Domestic News Print Industry

## Customs Bureau Officials Will Investigate Alleged Dumping of Canadian News Print Paper—Bond Required on All Shipments From Dominion to Protect United States Government—Should Dumping be Established Additional Duties May be Placed on Canadian News Print to Bring Price to Fair Level

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 18, 1933—The Treasury Department's investigation of the alleged dumping of Canadian news print in the United States at unfair prices, will be broad and may take several months, officials of the Customs Bureau state.

### Agents Study Domestic and Canadian Prices

Agents of the bureau are now studying the domestic and Canadian prices for news print, production costs and other features incident to dumping investigations.

The action is being taken under the anti-dumping act, and not under the Newspaper NRA Code.

### Charges Made

Charges were made that a Canadian firm was selling news print in the United States at a price under that charged in the Dominion market, to the injury of American industry. This constitutes dumping.

The Customs Bureau required that all news print imports from Canada be entered under a single entry bond, to protect the government in case the investigation discloses the existence of dumping.

### Duties May Be Imposed

In case dumping is established, duties will be placed on the Canadian news print in order to bring the price to what is considered a fair level.

* * *

### Dominion Regards Move Constructive

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., December 18, 1933—No surprise has been shown here at the step taken by the Treasury department of the United States Government in holding shipments of Canadian news print at the border under the U. S. dumping law.

In fact, the move was expected and is regarded as constructive in impressing on Canadian producers—as nothing in the past has done, despite understandings and agreements—that the problems of the industry can best be met in a spirit of co-operation rather than by unbridled competition.

No difficulty is anticipated for the exporters who have lived up to the self-imposed regulations of the News Print Export Manufacturers' Association of Canada, which has been co-operating with a similar organization formed in the United States to adjust matters for the whole industry under the NRA Code.

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### Paper Code Administration Discussed

Charles W. Boyce, secretary of the American Paper and Pulp Association, was the principal speaker at the regular weekly luncheon and meeting of the Eastern Division of the Salesmen's Association of the Paper Industry, which was held at the Hotel Woodstock, New York, on Monday last.

Mr. Boyce discussed the Paper Code Administration, which he defined as a broad educational campaign of which the result will depend on how the ideals are conceived and worked out by the paper industry as a whole. He stated that the Paper Industry Authority was getting into shape the Trade Customs and Practices for presentation at Washington and that Tuesday, January 23, had been recommended to the Administrator as a suitable date for the occasion.

Mr. Boyce also declared that the Paper Industry Authority was working out a Standard Cost Accounting System for the Paper Industry, covering the relation between filed prices and costs, to be eventually presented to the Administrator for approval.

Responsibility for enforcing compliance to the Code had been turned over by the administration to the Paper Industry Authority through its various subsidiary groups, stated Mr. Boyce. The Compliance Division in Washington will act as a Supreme Court, while a State Compliance Board had been appointed to give advice and assistance, if required.

Mr. Boyce also stated that the Paper Industry Authority was supporting the manufacturers in their protest against the compensatory tax on paper products, which is now effective.

It was announced that the gatherings would be adjourned until after the Yuletide holidays and that the next meeting and luncheon of the Eastern Division of the Salesmen's Association of the Paper Industry would be held on Monday, January 8.

# Paper Board Plant Consolidation Planned

## Alan G. Goldsmith, Vice-President of Milwaukee Corp., and Secretary of Mead Corp., Now in Charge of Movement—Elimination of Smaller Units Would Control Output and Stabilize Market—Program Going Ahead More Rapidly Under Recovery Code

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., December 18, 1933—Although the business of the Kieckhefer Container Company, Milwaukee, Wis., is 30 per cent under what it was three months ago, it is still 20 per cent ahead of what it was last year at this time. At the fourteen plants operated by the concern in various parts of the country, employment is below what it was in August but it is 35 per cent ahead of 1932, due, says President John Kieckhefer, to the shorter hours of the NRA.

Mr. Kieckhefer feels that prospects are a bit confused because of the monetary situation, but the industry as a whole has made much headway due both to the recovery administration's code and the paper board plan for mill consolidation.

This program, brought to its present status largely through the work of Willits Pollock, president of the Milwaukee Corporation, an investment company, up to the time of his recent death, will be carried on by Alan G. Goldsmith, secretary of the Mead Corporation, Dayton, Ohio. Mr. Goldsmith last week was elected vice-president of the Milwaukee Corporation by the board of directors. He formerly was a resident of Milwaukee, where the family is prominently known.

The paper board mill consolidation plan contemplated the purchase of smaller units by the larger companies and elimination of these from production either permanently or temporarily to control production sufficiently to keep the market stabilized and prevent ruinous price cutting and other competitive factors that worked to the disadvantage of all. Mr. Goldsmith will be in charge of the paper board plant consolidation plan for the Milwaukee company. He was a member of the Young plan group, spent some time in Germany, was once with the Department of Commerce under Herbert Hoover and for many years has been associated with the Mead Corporation. The program it is stated, is going ahead a little more rapidly under the paper board code.

### Claims Against Bates Valve Reduced

Damages of approximately $225,000 sought by the Hoskin-Morainville Paper Company, Menominee, Mich., from the Bates Valve Bag Corporation, also of Menominee were reduced to $7,354 in an award made by a jury in circuit court at that city last week.

The court directed a verdict of $731 for one month's rent of a factory building erected by the Hoskin-Morainville company for use of the bag company, and a further award of $6,623 for seventy tons of paper delivered to the bag factory.

Damages were sought largely on the plaintiff's claim of a contract existing between the two companies by which the defendant agreed to use certain quantities of paper annually produced by the Hoskin-Morainville mill. The testimony showed there was no contract drawn up, but that the understanding was based on conversations between officials, and correspondence between the two companies.

In directing the verdict, Judge Frank A. Bell prevented an award on the plaintiff's count alleging a joint venture between the litigants in operating the bag factory, constructed by the Hoskin-Morainville company and tenanted for several years by the bag company. This action balked the claim of the plaintiff for $64,000 spent on an addition to the bag factory. Rental claims after February 1, 1933 were denied and the jury instructed to award rent only for the month of January, 1933.

Damages based on the loss of profit on paper tonnage the bag company agreed to accept also were disallowed. The plaintiff alleged that the bag company contracted for 20,000 tons of paper to be delivered within a year, but received orders for only 13,000 tons. Loss of profit was asked on the remaining 7,000 tons. It was also claimed that the bag company contracted for 10,000 tons of paper in 1930 but accepted delivery on only 4,500 tons, and the plaintiff asked damages for loss of profit on the remaining 5,500 tons. The contract was denied by the bag company.

The claim allowed by the court was for payment of 70 tons of paper delivered to the bag factory and left in storage there. Contest on this point hinged on whether payment was due at $88 or $100 a ton. The amount allowed was $6,623.

### News of the Industry

Through the efforts of E. P. Gleason, chief engineer of the Nekoosa-Edwards Paper Company, a number of improvements will be made in the mill villages at Nekoosa and Port Edwards, Wis. under the CWA program. About $16,000 will be spent on Riverside Park, including the planting of a large number of trees. The forestry department of the paper mill will supervise the planting. The ball park used by mill teams also will be improved.

The prowess of A. C. Gilbert, president of the Gilbert Paper Company, Menasha, Wis., as an art collector is shown in a display he has loaned to Lawrence College, Appleton, Wis. It includes a group of thirty reproductions of water color paintings done by a group of Kiowa Indian artists. The exhibit is considered unusual as coming from a tribe once known as the fiercest and now by an amazing aptitude for art.

Shipments of spruce pulp wood from Canadian points to the Interlake Pulp and Paper Company division of the Consolidated Water Power and Paper Company at Appleton, Wis., will be started this week. The mill expects to receive about 20,000 cords at the rate of ten carloads a day until March. About the same number of carloads of mixed pulp-wood are arriving daily now from Michigan.

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## Paper Mill Employment Increases

Reports were received by the Bureau of Labor Statistics, Department of Labor, from 416 paper and pulp mills which gave their October employment at 101,951, an increase of 1 per cent over September and of 26.1 per cent over October, 1932. The average weekly payrolls in October were $1,899,065, an increase of .1 per cent over September and of 27.5 per cent over October, 1932.

The Bureau also received reports from 327 paper box plants which gave their October employment at 27,785, an increase of 1.8 per cent over September and of 25.8 per cent over October of last year. The average weekly payrolls were $486,336, an increase of .4 per cent over September and of 19.1 per cent over October of last year.

# Outlook For Coming Year Bright In Boston

## More Activity Anticipated in Various Sections of New England's Paper Industry Following Turn of Year—Demand for Fine Paper Somewhat Irregular—Some Improvement Noticed in Wrapping Paper Market—Box Board Quiet, With Prices Steady

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., December 18—Business with paper jobbers as a whole was hardly better than fair during last week, although here and there improvement was noted. Conditions generally in New England appear to be at least slightly better, especially in the heavy industries, resulting in more optimism in the paper trade. A few dealers in fine paper found a more active demand than in the previous week, while some experienced rather quiet business or spotty. The call for fancy box papers held up to a considerable degree. Indications are that next year there will be more activity in these lines than the present one has shown. According to some of the local dealers there will also be a tendency to step up the quality. As in the fine paper division, a few dealers saw improvement in wrapping paper, although with others the volume of sales was unsatisfactory. Box board was quiet, but prices remained unchanged.

### Better Feeling in Paper Stock

There was a little better feeling in paper stock, although, as a whole, the volume of sales was not large. An actual shortage exists in old newspapers, with the price remaining firm at .37½ @ .42½. More demand for bagging developed, with advances in three grades. Jute rope went up to 1.15 @ 1.35 as against a former quotation of 1.00 @1.15, scrap sisal to 1.25 @ 1.35, compared with 1.10 @ 1.15, and scrap sisal for shredding to 1.25 @ 1.35, compared with 1.15 @ 1.30. New and old domestic rags remained unchanged. Although roofing rags have advanced in New York, this commodity has not shown any appreciation in value locally as yet. There was little or no business in foreign rags, but no price changes. One house has been receiving letters from Japan, saying that dealers there can do no business on account of the conditions of Exchange.

### News of the Trade

The following have become members of the New England Paper Merchants Association: Julius Rosenbloom, Seth Winer Paper Company, Blackstone Paper Company, Pratt Paper Company, all of Boston; Sugarman Bros., Cambridge, Mass., and Waltham Woodenware and Paper Company, Waltham, Mass. Applications for membership have been received from Henry Lindenmeyer & Sons, Hartford, Conn., and Robert A. Wilcox & Co., Inc., Fall River, Mass.

A meeting of the Boston distributors of fancy and box papers was recently held at the Boston Chamber of Commerce to discuss the proposed trades customs of the Glazed and Fancy Paper Manufacturers Association. The sentiment of the meeting was that they would work with the association as regards the new credit terms and proposed trades customs. The meeting was attended by representatives of the following: Charles W. Williams & Co., Inc., Harry M. Cranmer Company, Inc., Storrs & Bement Company, Henry L. Goodman, and K. E. Tozier.

Bird & Son, Inc., has re-established the payment of its annual bonus to employees, after a lapse of two years, 1931 and 1932. The distribution will be made on December 29, according to an announcement of the company.

Michael J. Hawkins, manager of transportation, Bird & Son, was elected one of the directors for two years of the Traffic Club of New England at its annual meeting at the Copley-Plaza Hotel Dec. 14.

A sales meeting of John Carter & Co., Inc., with representatives of Byron Weston Company, Dalton, Mass., was held at the office of the former concern December 16. Leon M. Poore, of John Carter & Co., presided. Mr. Birt, of the Byron Weston Company, and Mr. Bugbee, of the Walter B. Snow advertising agency, Boston, spoke.

At the regular meeting of the American Paper Mills Supply Institute held December 11 at the Hotel Turaine, President Shuman and Secretary Folsom were chosen to sit on the board meeting early this week in New York to effect certain changes in the by-laws to conform with expected code requirements. Discussion of the Code took place at this meeting.

W. L. Daniels, of the L. L. Brown Paper Company, Adams, Mass., and H. L. Simons, Jr., of A. M. Collins Manufacturing Company, Philadelphia, Pa., called on the trade last week.

A permit for the construction of a building for storage and waste paper packing at 232 Maplewood street, Malden, Mass., has been issued to Frank P. and Victoria Meninno, 47 Madison street, Malden. The building is to be of cement block, one story, 35x55, and to cost $1,000.

The current rate on waste paper from Springfield, Mass., to Montville and Palmertown, Conn., is 15 cents per 100, either on a class rate or a commodity rate basis, but as the commodity tariff requires 24,000 c. l. minimum it will be cancelled, allowing the 20,00 c. l. minimum to apply.

The current rate on woodpulp from Berlin, N. H., minimum weight 50,000 pounds to New Brunswick, N. J., is to be cut from 27 cents to 26 cents.

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## S. Walter, Inc. Members of the National Paper Trade Association

Through an unfortunate inadvertence, the sign designating membership in the National Paper Trade Association was omitted before the name of S. Walter, Inc., general paper merchants, of 142-146 North Fifth Street, Philadephia in the 1934 edition of Lockwood's Directory. That this obviously was an error is indicated by the fact that the branch houses of the concern, the Andrews Paper House of York, Pa., and the Lehigh Paper House at Allentown, Pa., are correctly indicated as members of the National Paper Trade Association.

It is relevant also to state that the firm of S. Walter, Inc. has for years been among the representative paper merchants of Philadelphia and that its membership of the National Paper Trade Association is of long standing, so that lack of the proper designating sign in the Directory will be easily recognized as an error, which no matter how great care is exercised, is likely to occur in a printed work of this kind. But the error is greatly regretted nevertheless and this notice is printed so that no misunderstanding regarding the status of S. Walter, Inc., may arise.

# Demand for Paper Rather Spotty In Chicago

## Distributors of Various Standard Grades of Paper Generally Marking Time Until New Year Opens—Request for Fine Paper Falls Off Slightly—Kraft Wrapping Paper Market Generally Unchanged, With Price Situation Comparatively Firm

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, ILL. December 16, 1933—There is little of an exciting character in the Chicago paper market this week, with the exception of continued adjustments and study of the code of fair practices covering the paper industry. The processing tax on paper and paper products competing with cotton products stirred up considerable activity and the coarse paper firms directly affected by the tax are arranging to file as retail merchants to permit them an additional thirty days to clean their shelves. Marketwise, demand was reported slow and spotty. Buyers seemed disinclined to make commitments with inventory period so near at hand, evidently preferring to go through this period with cash assets and a light inventory. Paper representatives busy in past months filling commitments for holiday business are also marking time until after the first of the year. There is considerable belief that the early days of 1934 will show gradual improvement in the industry itself.

Meanwhile, specifically, the fine paper market reported a slackening in demand but not of a serious character. Prices remained about as they have been, the date of December 28 as final for adjustments under the code, being approached without a great deal of excitement. Kraft papers were about unchanged, the price situation comparatively satisfactory. Improvement in the volume of news print and ground woods purchased was reported. Books and covers reported a narrowed demand but nothing alarming considering the season of the year. Boards were unchanged. The waste market reflected the year end slowing down in the paper market itself.

### Merchants Discuss Processing Tax

Two very important items of business were before the Chicago Paper Association at its last meeting of 1933 on Tuesday, December 12, at the Blackstone Hotel. J. L. Fox, of Brown, Blumberg and Fox, legal representatives of the association, was present to explain the provisions of the processing tax affecting products competing with cotton goods coming under the processing tax and to announce the decision of the State Department of Finance in relation to the 2 per cent Occupational Tax of the State of Illinois.

The association filed an injunction some time ago restraining the State Department of Finance from bringing suit against the coarse paper group for the collection of the tax on certain items which the association ruled were for resale purposes and thus not under the "ultimate" provisions of the Act. According to Mr. Fox, the Department of Finance recognized the wishes of the association covering all merchandise noted in the injunction itself and is shortly to issue a regulation to that effect. Meanwhile, association members who have not been collecting the two per cent tax on all sales which were outside those included in the injunction, are being forced to segregate these from all sales which were for ultimate consumption and pay a tax from July 1, the date the law went into effect, until the present time.

As far as the processing tax is concerned, the tax will go into effect on three items:—Gummed tape, two inches wide or less; all grades and classes of paper towels and on jute twine, 275 feet to the pound or more. These three are judged in competition with cotton products and thus under the processing tax provisions. The ruling has affected manufacturers since December 1 when they have been adding the tax to all invoices. The association was given the option of coming under the classification of retailers or wholesalers and, at the December 12 meeting, decided to file as retailers, thus giving them thirty days to clear their shelves of the merchandise that had been accumulated prior to the time that the processing tax went into effect.

### News of the Trade

Several Chicago paper representatives have been interested in the revised simplified practice recommendation R22-33, on the subject of paper (basic sheet sizes) which is now available in printed form from the Department of Commerce, Bureau of Standards, at Washington, D. C. The recommendation which was proposed and developed by the paper industry, is concerned with the basic sheet sizes of paper. Ten sheet sizes were added to this revised simplification program by the standing committee of the industry. Also, specific headings for the various sections of the recommendations have been included by the committee.

The Swigart Paper Company utilizes one of its most popular announcement papers and in announcement form to provide information on plain and colored cards and sheets with envelopes to match and especially effective for direct-mail campaigns. "For the artistic and attractive display of advertising craftsmanship in the form of books, brochures, folders, posters, Swigart papers offer an unfailing variety of material hand, mould and machine made and in a wide range of sizes", reads the copy.

In a previous announcement of the cooperation being extended by the paper industry in raising funds for Chicago charity work the name of Henry Prosser, of Bermingham & Prosser, was not given as in charge of the funds collected from the Fine Paper Division for this meritorious work. Mr. Prosser, according to reports, is doing a splendid piece of work along with other representatives of other lines of paper.

Chicago printers are reported to have joined with the National Association of Waste Material Producers in their efforts to urge NRA authorities to permit producers of waste materials to market these by-products without being obliged to sell them to dealers—in other words to maintain an open market for these products at all times. The waste material producers issued a complete account of their efforts to maintain this open market, such an account having been outlined in a recent issue of the PAPER TRADE JOURNAL. This week S. F. Beatty, president of the Printing Trades Secretary-Managers Association, has sent out a bulletin suggesting that the Waste Material Producers Association be permitted to represent the printers of this vicinity at Washington, D. C., so that these interests in waste paper may be fully represented and protected.

# Ontario Paper Manufacturers Fairly Active

## Fine Paper Mills Report Demand Well Maintained, Despite Off Season Due to Approach of Yuletide Holidays—Request for Cover Papers Holding Up Well—Coarse Paper Plants Operating Lightly, With Supplies Moving Slowly

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., December 18, 1933—The month of December is panning out well as far as mill activities in paper manufacturing circles in Ontario go and it is estimated that the tonnage turned out and disposed of, particularly in fine papers, for the last month in the year, will be greater than last year for the same period, with the ratio of profit about the same as last year.

Most of the fine paper mills report that demand is keeping up well despite the fact that this is the off season induced by the near approach of Christmas and the new year. December is a month when mills will operate for about three weeks, while there will be a week or two between the end of the old and the beginning of the new year, when operations will cease while repairs are being made to plants.

Manufacturers of cover papers, tag manilas, and some specialty lines, report that the call for these lines is keeping up well for December, although it is possible that makers of book, bond, writing and ledger papers are not so favorably placed, although the year with them, also, is winding up fairly well.

Manufacturers of course papers are operating lightly and demand has fallen off as the year ends, while the same may be said of paper bags. The sale of kraft wrapping is keeping up well although there is very little export trade in that line.

The year is ending very well for the manufacturers of light weight papers, there being a well sustained demand for all lines of tissues, toilets and fancy crepe papers. On the other hand the paper converting trade is perhaps even quieter than it was during November and December of last year. Envelope manufacturers are only moderately busy and there is a decidedly light call for blanks, books and general stationery lines represented in the paper converting trade.

With the light demand for board by the paper box manufacturers the box board industry is operating at not more than 75 per cent capacity. Paper box manufacturers have been having some Christmas repeat orders but the Christmas business turned up so late this year that it hurt the volume.

Effective December 14 two of the cheaper grades of sulphite papers were increased by half a cent a pound it was learned from the Canadian Paper Trade Association. It is pointed out that pulp has increased $15 a ton since last spring and this has finally caused the increase in the finished product. The new prices will likely remain firm until Spring.

### Wallpaper Firms Doing Well

Sun-tested Wallpapers, Ltd., a recent addition to Toronto's industries, has increased its plant by 11,000 square feet and now occupies the entire building at 1244 Dufferin street, containing a total of 35,000 square feet of floor space. The company is installing an additional wallpaper machine, which will increase the output by 50 per cent. For some time the factory staff has been working both day and night shifts. The company was formed and commenced manufacturing during the past summer. It is affiliated with United Wallpaper Factories Inc., of the United States. H. C. Jarvis is president and general manager.

### Pulp Cutters' Strike Settled

With the Ontario Government playing a prominent part, settlement of three northern pulp cutters' strikes, involving close to 2,000 men, was reached on December 14. From the back woods timber camps, where they were organized to fight for higher wages and better living conditions, the workers walked out about a month ago.

When two hundred Abitibi Power and Paper Company employees cheered the good news at Ansonville that they would start work again on the 15th, the long standing strike was definitely over in the Northern Ontario country. Previously, the Hon. Wm. Finlayson, Minister of Lands and Forests, had announced that terms had been agreed between workers and operators at Cochrane and Port Arthur. Strike leaders said that demands had been about 85 per cent complied with.

Pulp-cutters in the Ansonville section will receive wages of from $28 to $35 a month, or three to five cents a log for piece work. These men paraded through the snow when they walked out, but the Abitibi company announced that they would be taken back to Camp by train and sleigh. Some of the camps are thirty miles distant from Ansonville.

Workers at Cochrane and Port Arthur won concessions in matters of wages and board, while operators were granted a reduction in timber dues by the Government.

Port Arthur district men will receive $2 a single cord and $3.50 a double cord under the new scale, and will be charged 75 cents a day board by the companies instead of 90 cents and a dollar. Mr. Finlayson said the Government had agreed to reduce the dues on spruce pulpwood from $1.40 a cord to $1 a cord for the current year.

## To Be Chief of Trade Association Division

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 20, 1933—General Hugh S. Johnson has appointed Dr. Wilson Compton Chief of the Trade Association Division, NRA.

Under the plan for Code Administration, NRA is seeking to coordinate the facilities of the various industries with those established by the Administration. Practical and fair standards by which the competence of industry associations or their code authorities to act as agencies of self-government are being determined in keeping with the policy of strengthening the permanent association establishment of American industry.

Dr. Wilson Compton has agreed to undertake this work until the means of industrial self-regulation has been firmly established. He is one of the outstanding trade association executives, being general manager of the National Lumber Manufacturers Association and related forest products industry and a member of its Code Authority, Chairman of the Committee on Industry Planning of the American Trade Association Executives, and for some time associated with the Industrial Advisory Board, specializing on Trade Association and Code Authority matters.

# Philadelphia Paper Market Shows Upward Trend

## Betterment of Conditions Resting on More Stable Basis Than During Mid-Summer Movement —Wholesale Paper Merchants Expect to Swing Along on Even Keel—Bond and Ledger Papers in Average Demand for Season—Paper Stock Section Conditions Irregular

PHILADELPHIA, Pa., December 18, 1933—Quite aside from seasonal influences, which have a strong bearing on the current advancement, the trend is upward and the betterment is resting on a more stable basis than during the mid-summer upswing. Box board and cellophane remain strong; news board being quoted at $50 a ton, and chip board at $45. There is good business in box papers, particularly in fancy boxes for candy, etc. Paper stock as a whole is rather dull; however, prices still maintain for the better grades, but offerings for the cheaper grades are nil. Bonds and ledgers are in average demand.

It was reported at the last meeting of the Paper Trade Association that the one house which was outside the Credit Group had come in and now this group is one hundred per cent organized, and it was further said that $20,000 in actual cash has been paid the paper houses to secure the removal of names from the delinquent list; this does not take into consideration people who gave notes and trade acceptances.

With inventory season in the offing, it is believed that some really good business will be available, and the wholesale paper trade will swing along on an even keel.

### Paper and Cordage Merchants Entertain

Several bus loads of kiddies, invited by the Philadelphia Paper and Cordage Association, and recruited from the ranks of the Salvation Army, were given happy hours on Friday last in the Rose Room of the Adelphia Hotel. The room was tastefully decorated, a glittering tree occupying one end of the room. Santa Claus was there in life in the person of C. D. Turner, who in ordinary days is in the organization of Wailes Dove-Hermiston Corporation, at 401 North Broad street. The long banquet tables were so arranged that opposite each little guest there was seated a member of the association who spared no trouble to see that his charge was amply served.

The Rev. Croswell McBee, Pastor of Old Saint Davids, Devon, Pa., invoked benediction, and an invitation to serve as chaplain of the association was accepted by Dr. McBee. Communal singing of Christmas hymns by the children was participated in by the one hundred members of the association and their wives and sweethearts who attended. Mrs. William Horace Brown presiding at the piano, rendered some very choice musical selections. The dinner was further enlivened by members of the orchestra from the Adelphia Hotel who marched up and down and all around the room playing hill-billie songs.

To use the words of President George K. Hooper: "We thought we were going to entertain these children but the fact is they are entertaining us. Just to illustrate, let me say that there occurred a misunderstanding with regard to the date of this Christmas party—the Salvation Army officers being under the impression it was to take place at a later date—but through a trick of fate we discovered this just a day or so ago and were able to carry out our plans, as previously arranged. Now, can you imagine how disappointed we men would have been to have come here and not find these children? Well, that is what I mean to convey when I say these children are entertaining us." Leonard Fitzgerald, a member of the association, won hearty applause by his inimitable recital of "That Old Sweetheart of Mine."

Each small guest, filled to the ears with turkey and all the fixin's, was provided with a bag laden with candy, toys, fruit and a nice warm sweater, after which they bundled themselves into their coats and boarded buses for the trek home. A vote of praise and thanks was given by those attending to Steve Rigoli, banquet manager of the Adelphia.

This being the regular monthly meeting date of the Philadelphia Paper and Cordage association, the following candidates selected by the Nominating Committee, for election to office, were announced: President, George K. Hooper; Vice-President, Amos Coath; Treasurer, Frederick I. Brower; Secretary, H. S. Platt; Directors: Leslie Bartlett; Stanleigh Brower; Dan Crimmins; V. A. Dirvin; J. R. Howarth and E. L. Richards.

### Trade Association Institute Plans

The Trade Association Institute, recently organized with headquarters here, at a dinner at Kugler's Restaurant during the week, anounced plans for extension with the goal of co-ordinating trade association activities for the more efficient administration of industrial practice codes. In outlining the objects of the Institute, Howard P. Beckett, its counsel, who is also commissioner of the National Paper Box Manufacturers Association, declared that much of the confusion delaying approval of codes has been due to failure of the Government, industry and trade association to understand just what was meant by trade associations. Other speakers were William A. Meeks, executive secretary of the Typothetae of Philadelphia, president of the Institute; Warner S. Hays, secretary and treasurer of the Institute, and Harry K. Sorensen, District Compliance Director of the NRA. Donald R. Richberg, general counsel of NRA, later met with the officers of the Institute and expressed hearty approval of its aims and aspirations.

---

## Paper Mill Payrolls Stolen

TURNER'S FALLS, Mass., December 18, 1933—In a daring robbery, $23,000, representing approximately the payrolls of the Keith Paper Company and the Esleeck Manufacturing Company of this place, was stolen by four armed men from the Crocker National Bank here Wednesday morning. All the money stolen was covered by insurance. W. Johnes Morgan, vice-president of the bank, estimated the amount stolen to be $23,000, all in small bills and change. Several non-negotiable securities were taken also.

The Keith Paper Company and the Esleeck Manufacturing Company obtained their money for the payrolls from the Franklin County Bank and Trust Company and the First National Bank and Trust Company, both of Greenfield, Mass.

---

## Alex. Israel To Be Production Manager

L. H. Gaetz, president and general manager of Eastern States Carton Corporation, Brooklyn, N. Y., announces the appointment of Alex. Israel, formerly with Central Carton Company, as production manager of Eastern States Carton Corporation.

# Adverse Statements Regarding News Print From Southern Pine Refuted

510 W. River St., Savannah, Ga., Dec. 15, 1933.

EDITOR, PAPER TRADE JOURNAL:

In the issues of Paper Trade Journal of November 30 and December 7, I note the criticisms and comments of southern pine news print reported by your Montreal correspondent. The statements of the unnamed Canadian experts, observers and authorities in the November 30 issue, illustrate the interesting series of changes on the part of the doubters and critics of the experiment here to demonstrate the suitability of Georgia pine for news print.

Until pulp and paper were actually made in the laboratory a few months ago and printed on the presses of the *Savannah Evening Press* at 30,000 copies per hour, it was positively asserted by many experts that it could not be done, since Georgia yellow pines could not be pulped by the sulphite process because of its pitch content—neither could white paper be made from pine ground wood because of the known yellow color of the wood. However, sulphite of satisfactory quality for news print was made, and the groundwood instead of being yellow is as bright as spruce and even brighter.

It was then contended that even if there might be no evidence of pitch in the pulps it would show itself on the paper machine. No pitch trouble being encountered on the laboratory machine, it was then said that they would surely appear if the pine pulps were run over a commercial paper machine. It was also considered altogether doubtful if the paper could be made at normal commercial speeds. These contentions were again disproved by the eight and a half hour run at 740-ft. per minute, without a break or any interruption, at the Beaver Wood Fibre Company, Ltd. plant at Thorold, Ont.

It is now said that in a longer run the pitch troubles might have developed.

As to the news print made entirely from Georgia pine pulps and its printing quality, it was first asserted that if paper could be made the sheet would necessarily be harsh and brittle, would not have sufficient strength for high speed rotary presses, would have low opacity causing show-through, and would require an excessive amount of ink for printing. All these forecasts were disproven very conclusively by the nine daily newspapers in Georgia which used the paper from the commercial run on their regular editions of November 20. The only adverse criticism of the surviving die-hard critics has been that the paper is really too soft and flexible.

Regarding the press performance and printing quality it will be of interest to quote the reports of some of the newspapers:

Clark Howell, editor and general manager of the *Atlanta Constitution*, said, "I was informed by the pressman that he never had a better run in his life. The paper looked fine and exceeded all expectations."

John Paschall, managing editor of the *Atlanta Journal:* "Our early edition printed on Georgia pine was beautifully printed. The paper takes ink well with cuts printing up as well as on paper from other woods we have used. We are delighted with the new paper."

Leonard Roan, managing editor of the *Atlanta Georgian:* "The *Georgian's* first trial of pine pulp paper has been surprisingly satisfactory. The pine paper seemed a bit softer than spruce paper but has a good finish on both sides and is quite strong. One press ran an edition of 20,000 copies without a break. The printing was as good as on spruce paper."

P. T. Anderson, Jr., assistant general manager of the *Macon Telegraph* and *Macon News:* "The press run for this morning's paper was a huge success. The paper far surpassed my expectations as to what it would do. There was apparently no static as has been very annoying for the past few days. The entire run was made without a single break that could be blamed on the paper. The spring was as good as on any other news print. The ink penetration was sufficient to give a good print and yet did not show in white spaces on the reverse side. We found we got sixty-five pages to the pound on paper which is comparable to any other news print. The toughness, yet softness, of the paper was very noticeable. Dr. Herty is certainly to be commended for putting out such a superior product. I am all for it."

W. M. Pryse, managing editor of the *Albany Herald,* said today's edition of the *Herald* was printed on the Georgia news print and "worked to a perfection on our press. There was no break of the web or anything that looked like one. The print was excellent and clear, and left nothing to be desired. Subscribers spoke with pleasure of the soft, smooth texture and whiteness of the new paper. Our experience with Georgia pine news print was more than satisfactory in every way."

The *Brunswick News* reported "great success" with the news print and said, "It went through its full press run without trouble or breaks in the web. No difficulties were experienced and the pressmen were delighted with the print."

Jack Williams, editor and publisher of the *Waycross Journal-Herald,* said, "Our experience with news print made from Georgia pine was eminently successful in every way. The score stands, no breaks, free from static, clear print, perfect ink distribution. In fact, we have never had a more satisfactory run. Another thing about this Georgia paper, while strong enough to avoid breaks, it seems much lighter than the paper we have been using, which will mean a saving in mailing expense. We are ready to contract for Georgia paper exclusively. More power to Dr. Herty and his associates who have made this great feat possible."

Now, since the suitability of Southern pine has been demonstrated and, with great evident reluctance, more or less conceded by the Montreal "authority" according to his reported statement "Broadly speaking, there appears here general recognition of the potentialities of news print manufacture from Southern pine"—this "authority," as well as Mr. Robert P. Kernan, president of Donaconna Paper Company, takes comfort in the belief that it will be at least fifteen years before sufficient pulpwood will be available.

Mr. Kernan says, "According to my information, they get about one cord an acre of regrowth in fifteen years"; and the "authority" states, "For the next decade or so should be considered of relatively little importance. Southern pine for news print uses it is estimated should be approximately fifteen years old but it is indicated by Dr. Herty that younger trees can be used to advantage."

In the first place, as to regrowth, I would refer to Cir-

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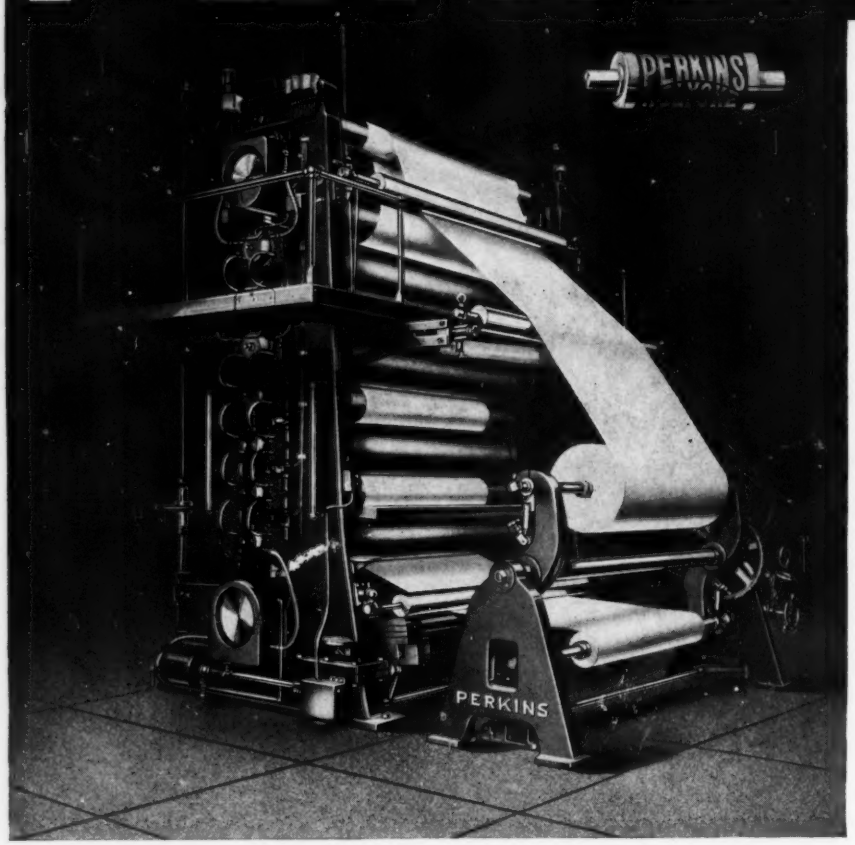


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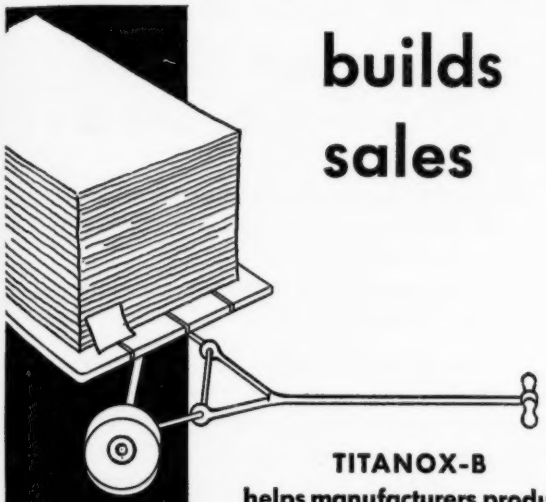

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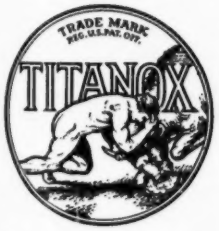


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# PAPER TRADE JOURNAL

ESTABLISHED 1872

SIXTY-SECOND YEAR

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

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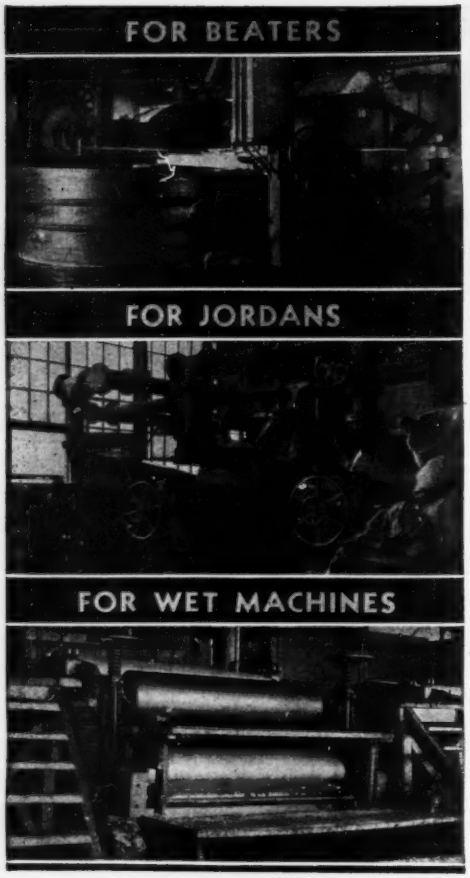


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PAPER

Vol. XCVII, No. 25 — Thursday, December 21, 1933

# Treasury to Aid Domestic News Print Industry

## Customs Bureau Officials Will Investigate Alleged Dumping of Canadian News Print Paper—Bond Required on All Shipments From Dominion to Protect United States Government—Should Dumping be Established Additional Duties May be Placed on Canadian News Print to Bring Price to Fair Level

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 18, 1933—The Treasury Department's investigation of the alleged dumping of Canadian news print in the United States at unfair prices, will be broad and may take several months, officials of the Customs Bureau state.

### Agents Study Domestic and Canadian Prices

Agents of the bureau are now studying the domestic and Canadian prices for news print, production costs and other features incident to dumping investigations.

The action is being taken under the anti-dumping act, and not under the Newspaper NRA Code.

### Charges Made

Charges were made that a Canadian firm was selling news print in the United States at a price under that charged in the Dominion market, to the injury of American industry. This constitutes dumping.

The Customs Bureau required that all news print imports from Canada be entered under a single entry bond, to protect the government in case the investigation discloses the existence of dumping.

### Duties May Be Imposed

In case dumping is established, duties will be placed on the Canadian news print in order to bring the price to what is considered a fair level.

* * *

### Dominion Regards Move Constructive

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., December 18, 1933—No surprise has been shown here at the step taken by the Treasury department of the United States Government in holding shipments of Canadian news print at the border under the U. S. dumping law.

In fact, the move was expected and is regarded as constructive in impressing on Canadian producers—as nothing in the past has done, despite understandings and agreements—that the problems of the industry can best be met in a spirit of co-operation rather than by unbridled competition.

No difficulty is anticipated for the exporters who have lived up to the self-imposed regulations of the News Print Export Manufacturers' Association of Canada, which has been co-operating with a similar organization formed in the United States to adjust matters for the whole industry under the NRA Code.

---

## Paper Code Administration Discussed

Charles W. Boyce, secretary of the American Paper and Pulp Association, was the principal speaker at the regular weekly luncheon and meeting of the Eastern Division of the Salesmen's Association of the Paper Industry, which was held at the Hotel Woodstock, New York, on Monday last.

Mr. Boyce discussed the Paper Code Administration, which he defined as a broad educational campaign of which the result will depend on how the ideals are conceived and worked out by the paper industry as a whole. He stated that the Paper Industry Authority was getting into shape the Trade Customs and Practices for presentation at Washington and that Tuesday, January 23, had been recommended to the Administrator as a suitable date for the occasion.

Mr. Boyce also declared that the Paper Industry Authority was working out a Standard Cost Accounting System for the Paper Industry, covering the relation between filed prices and costs, to be eventually presented to the Administrator for approval.

Responsibility for enforcing compliance to the Code had been turned over by the administration to the Paper Industry Authority through its various subsidiary groups, stated Mr. Boyce. The Compliance Division in Washington will act as a Supreme Court, while a State Compliance Board had been appointed to give advice and assistance, if required.

Mr. Boyce also stated that the Paper Industry Authority was supporting the manufacturers in their protest against the compensatory tax on paper products, which is now effective.

It was announced that the gatherings would be adjourned until after the Yuletide holidays and that the next meeting and luncheon of the Eastern Division of the Salesmen's Association of the Paper Industry would be held on Monday, January 8.

# Paper Board Plant Consolidation Planned

## Alan G. Goldsmith, Vice-President of Milwaukee Corp., and Secretary of Mead Corp., Now in Charge of Movement—Elimination of Smaller Units Would Control Output and Stabilize Market—Program Going Ahead More Rapidly Under Recovery Code

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., December 18, 1933—Although the business of the Kieckhefer Container Company, Milwaukee, Wis., is 30 per cent under what it was three months ago, it is still 20 per cent ahead of what it was last year at this time. At the fourteen plants operated by the concern in various parts of the country, employment is below what it was in August but it is 35 per cent ahead of 1932, due, says President John Kieckhefer, to the shorter hours of the NRA.

Mr. Kieckhefer feels that prospects are a bit confused because of the monetary situation, but the industry as a whole has made much headway due both to the recovery administration's code and the paper board plan for mill consolidation.

This program, brought to its present status largely through the work of Willits Pollock, president of the Milwaukee Corporation, an investment company, up to the time of his recent death, will be carried on by Alan G. Goldsmith, secretary of the Mead Corporation, Dayton, Ohio. Mr. Goldsmith last week was elected vice-president of the Milwaukee Corporation by the board of directors. He formerly was a resident of Milwaukee, where the family is prominently known.

The paper board mill consolidation plan contemplated the purchase of smaller units by the larger companies and elimination of these from production either permanently or temporarily to control production sufficiently to keep the market stabilized and prevent ruinous price cutting and other competitive factors that worked to the disadvantage of all. Mr. Goldsmith will be in charge of the paper board plant consolidation plan for the Milwaukee company. He was a member of the Young plan group, spent some time in Germany, was once with the Department of Commerce under Herbert Hoover and for many years has been associated with the Mead Corporation. The program it is stated, is going ahead a little more rapidly under the paper board code.

### Claims Against Bates Valve Reduced

Damages of approximately $225,000 sought by the Hoskin-Morainville Paper Company, Menominee, Mich., from the Bates Valve Bag Corporation, also of Menominee were reduced to $7,354 in an award made by a jury in circuit court at that city last week.

The court directed a verdict of $731 for one month's rent of a factory building erected by the Hoskin-Morainville company for use of the bag company, and a further award of $6,623 for seventy tons of paper delivered to the bag factory.

Damages were sought largely on the plaintiff's claim of a contract existing between the two companies by which the defendant agreed to use certain quantities of paper annually produced by the Hoskin-Morainville mill. The testimony showed there was no contract drawn up, but that the understanding was based on conversations between officials, and correspondence between the two companies.

In directing the verdict, Judge Frank A. Bell prevented an award on the plaintiff's count alleging a joint venture between the litigants in operating the bag factory, constructed by the Hoskin-Morainville company and tenanted for several years by the bag company. This action balked the claim of the plaintiff for $64,000 spent on an addition to the bag factory. Rental claims after February 1, 1933 were denied and the jury instructed to award rent only for the month of January, 1933.

Damages based on the loss of profit on paper tonnage the bag company agreed to accept also were disallowed. The plaintiff alleged that the bag company contracted for 20,000 tons of paper to be delivered within a year, but received orders for only 13,000 tons. Loss of profit was asked on the remaining 7,000 tons. It was also claimed that the bag company contracted for 10,000 tons of paper in 1930 but accepted delivery on only 4,500 tons, and the plaintiff asked damages for loss of profit on the remaining 5,500 tons. The contract was denied by the bag company.

The claim allowed by the court was for payment of 70 tons of paper delivered to the bag factory and left in storage there. Contest on this point hinged on whether payment was due at $88 or $100 a ton. The amount allowed was $6,623.

### News of the Industry

Through the efforts of E. P. Gleason, chief engineer of the Nekoosa-Edwards Paper Company, a number of improvements will be made in the mill villages at Nekoosa and Port Edwards, Wis. under the CWA program. About $16,000 will be spent on Riverside Park, including the planting of a large number of trees. The forestry department of the paper mill will supervise the planting. The ball park used by mill teams also will be improved.

The prowess of A. C. Gilbert, president of the Gilbert Paper Company, Menasha, Wis., as an art collector is shown in a display he has loaned to Lawrence College, Appleton, Wis. It includes a group of thirty reproductions of water color paintings done by a group of Kiowa Indian artists. The exhibit is considered unusual as coming from a tribe once known as the fiercest and now by an amazing aptitude for art.

Shipments of spruce pulp wood from Canadian points to the Interlake Pulp and Paper Company division of the Consolidated Water Power and Paper Company at Appleton, Wis., will be started this week. The mill expects to receive about 20,000 cords at the rate of ten carloads a day until March. About the same number of carloads of mixed pulp-wood are arriving daily now from Michigan.

---

## Paper Mill Employment Increases

Reports were received by the Bureau of Labor Statistics, Department of Labor, from 416 paper and pulp mills which gave their October employment at 101,951, an increase of 1 per cent over September and of 26.1 per cent over October, 1932. The average weekly payrolls in October were $1,899,065, an increase of .1 per cent over September and of 27.5 per cent over October, 1932.

The Bureau also received reports from 327 paper box plants which gave their October employment at 27,785, an increase of 1.8 per cent over September and of 25.8 per cent over October of last year. The average weekly payrolls were $486,336, an increase of .4 per cent over September and of 19.1 per cent over October of last year.

# Outlook For Coming Year Bright In Boston

## More Activity Anticipated in Various Sections of New England's Paper Industry Following Turn of Year—Demand for Fine Paper Somewhat Irregular—Some Improvement Noticed in Wrapping Paper Market—Box Board Quiet, With Prices Steady

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., December 18—Business with paper jobbers as a whole was hardly better than fair during last week, although here and there improvement was noted. Conditions generally in New England appear to be at least slightly better, especially in the heavy industries, resulting in more optimism in the paper trade. A few dealers in fine paper found a more active demand than in the previous week, while some experienced rather quiet business or spotty. The call for fancy box papers held up to a considerable degree. Indications are that next year there will be more activity in these lines than the present one has shown. According to some of the local dealers there will also be a tendency to step up the quality. As in the fine paper division, a few dealers saw improvement in wrapping paper, although with others the volume of sales was unsatisfactory. Box board was quiet, but prices remained unchanged.

### Better Feeling in Paper Stock

There was a little better feeling in paper stock, although, as a whole, the volume of sales was not large. An actual shortage exists in old newspapers, with the price remaining firm at .37½ @ .42½. More demand for bagging developed, with advances in three grades. Jute rope went up to 1.15 @ 1.35 as against a former quotation of 1.00 @1.15, scrap sisal to 1.25 @ 1.35, compared with 1.10 @ 1.15, and scrap sisal for shredding to 1.25 @ 1.35, compared with 1.15 @ 1.30. New and old domestic rags remained unchanged. Although roofing rags have advanced in New York, this commodity has not shown any appreciation in value locally as yet. There was little or no business in foreign rags, but no price changes. One house has been receiving letters from Japan, saying that dealers there can do no business on account of the conditions of Exchange.

### News of the Trade

The following have become members of the New England Paper Merchants Association: Julius Rosenbloom, Seth Winer Paper Company, Blackstone Paper Company, Pratt Paper Company, all of Boston; Sugarman Bros., Cambridge, Mass., and Waltham Woodenware and Paper Company, Waltham, Mass. Applications for membership have been received from Henry Lindenmeyer & Sons, Hartford, Conn., and Robert A. Wilcox & Co., Inc., Fall River, Mass.

A meeting of the Boston distributors of fancy and box papers was recently held at the Boston Chamber of Commerce to discuss the proposed trades customs of the Glazed and Fancy Paper Manufacturers Association. The sentiment of the meeting was that they would work with the association as regards the new credit terms and proposed trades customs. The meeting was attended by representatives of the following: Charles W. Williams & Co., Inc., Harry M. Cranmer Company, Inc., Storrs & Bement Company, Henry L. Goodman, and K. E. Tozier.

Bird & Son, Inc., has re-established the payment of its annual bonus to employees, after a lapse of two years, 1931 and 1932. The distribution will be made on December 29, according to an announcement of the company.

Michael J. Hawkins, manager of transportation, Bird & Son, was elected one of the directors for two years of the Traffic Club of New England at its annual meeting at the Copley-Plaza Hotel Dec. 14.

A sales meeting of John Carter & Co., Inc., with representatives of Byron Weston Company, Dalton, Mass., was held at the office of the former concern December 16. Leon M. Poore, of John Carter & Co., presided. Mr. Birt, of the Byron Weston Company, and Mr. Bugbee, of the Walter B. Snow advertising agency, Boston, spoke.

At the regular meeting of the American Paper Mills Supply Institute held December 11 at the Hotel Turaine, President Shuman and Secretary Folsom were chosen to sit on the board meeting early this week in New York to effect certain changes in the by-laws to conform with expected code requirements. Discussion of the Code took place at this meeting.

W. L. Daniels, of the L. L. Brown Paper Company, Adams, Mass., and H. L. Simons, Jr., of A. M. Collins Manufacturing Company, Philadelphia, Pa., called on the trade last week.

A permit for the construction of a building for storage and waste paper packing at 232 Maplewood street, Malden, Mass., has been issued to Frank P. and Victoria Meninno, 47 Madison street, Malden. The building is to be of cement block, one story, 35x55, and to cost $1,000.

The current rate on waste paper from Springfield, Mass., to Montville and Palmertown, Conn., is 15 cents per 100, either on a class rate or a commodity rate basis, but as the commodity tariff requires 24,000 c. l. minimum it will be cancelled, allowing the 20,00 c. l. minimum to apply.

The current rate on woodpulp from Berlin, N. H., minimum weight 50,000 pounds to New Brunswick, N. J., is to be cut from 27 cents to 26 cents.

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## S. Walter, Inc. Members of the National Paper Trade Association

Through an unfortunate inadvertence, the sign designating membership in the National Paper Trade Association was omitted before the name of S. Walter, Inc., general paper merchants, of 142-146 North Fifth Street, Philadephia in the 1934 edition of Lockwood's Directory. That this obviously was an error is indicated by the fact that the branch houses of the concern, the Andrews Paper House of York, Pa., and the Lehigh Paper House at Allentown, Pa., are correctly indicated as members of the National Paper Trade Association.

It is relevant also to state that the firm of S. Walter, Inc. has for years been among the representative paper merchants of Philadelphia and that its membership of the National Paper Trade Association is of long standing, so that lack of the proper designating sign in the Directory will be easily recognized as an error, which no matter how great care is exercised, is likely to occur in a printed work of this kind. But the error is greatly regretted nevertheless and this notice is printed so that no misunderstanding regarding the status of S. Walter, Inc., may arise.

# Demand for Paper Rather Spotty In Chicago

## Distributors of Various Standard Grades of Paper Generally Marking Time Until New Year Opens—Request for Fine Paper Falls Off Slightly—Kraft Wrapping Paper Market Generally Unchanged, With Price Situation Comparatively Firm

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, ILL. December 16, 1933—There is little of an exciting character in the Chicago paper market this week, with the exception of continued adjustments and study of the code of fair practices covering the paper industry. The processing tax on paper and paper products competing with cotton products stirred up considerable activity and the coarse paper firms directly affected by the tax are arranging to file as retail merchants to permit them an additional thirty days to clean their shelves. Marketwise, demand was reported slow and spotty. Buyers seemed disinclined to make commitments with inventory period so near at hand, evidently preferring to go through this period with cash assets and a light inventory. Paper representatives busy in past months filling commitments for holiday business are also marking time until after the first of the year. There is considerable belief that the early days of 1934 will show gradual improvement in the industry itself.

Meanwhile, specifically, the fine paper market reported a slackening in demand but not of a serious character. Prices remained about as they have been, the date of December 28 as final for adjustments under the code, being approached without a great deal of excitement. Kraft papers were about unchanged, the price situation comparatively satisfactory. Improvement in the volume of news print and ground woods purchased was reported. Books and covers reported a narrowed demand but nothing alarming considering the season of the year. Boards were unchanged. The waste market reflected the year end slowing down in the paper market itself.

### Merchants Discuss Processing Tax

Two very important items of business were before the Chicago Paper Association at its last meeting of 1933 on Tuesday, December 12, at the Blackstone Hotel. J. L. Fox, of Brown, Blumberg and Fox, legal representatives of the association, was present to explain the provisions of the processing tax affecting products competing with cotton goods coming under the processing tax and to announce the decision of the State Department of Finance in relation to the 2 per cent Occupational Tax of the State of Illinois.

The association filed an injunction some time ago restraining the State Department of Finance from bringing suit against the coarse paper group for the collection of the tax on certain items which the association ruled were for resale purposes and thus not under the "ultimate" provisions of the Act. According to Mr. Fox, the Department of Finance recognized the wishes of the association covering all merchandise noted in the injunction itself and is shortly to issue a regulation to that effect. Meanwhile, association members who have not been collecting the two per cent tax on all sales which were outside those included in the injunction, are being forced to segregate these from all sales which were for ultimate consumption and pay a tax from July 1, the date the law went into effect, until the present time.

As far as the processing tax is concerned, the tax will go into effect on three items:—Gummed tape, two inches wide or less; all grades and classes of paper towels and on jute twine, 275 feet to the pound or more. These three are judged in competition with cotton products and thus under the processing tax provisions. The ruling has affected manufacturers since December 1 when they have been adding the tax to all invoices. The association was given the option of coming under the classification of retailers or wholesalers and, at the December 12 meeting, decided to file as retailers, thus giving them thirty days to clear their shelves of the merchandise that had been accumulated prior to the time that the processing tax went into effect.

### News of the Trade

Several Chicago paper representatives have been interested in the revised simplified practice recommendation R22-33, on the subject of paper (basic sheet sizes) which is now available in printed form from the Department of Commerce, Bureau of Standards, at Washington, D. C. The recommendation which was proposed and developed by the paper industry, is concerned with the basic sheet sizes of paper. Ten sheet sizes were added to this revised simplification program by the standing committee of the industry. Also, specific headings for the various sections of the recommendations have been included by the committee.

The Swigart Paper Company utilizes one of its most popular announcement papers and in announcement form to provide information on plain and colored cards and sheets with envelopes to match and especially effective for direct-mail campaigns. "For the artistic and attractive display of advertising craftsmanship in the form of books, brochures, folders, posters, Swigart papers offer an unfailing variety of material hand, mould and machine made and in a wide range of sizes", reads the copy.

In a previous announcement of the cooperation being extended by the paper industry in raising funds for Chicago charity work the name of Henry Prosser, of Bermingham & Prosser, was not given as in charge of the funds collected from the Fine Paper Division for this meritorious work. Mr. Prosser, according to reports, is doing a splendid piece of work along with other representatives of other lines of paper.

Chicago printers are reported to have joined with the National Association of Waste Material Producers in their efforts to urge NRA authorities to permit producers of waste materials to market these by-products without being obliged to sell them to dealers—in other words to maintain an open market for these products at all times. The waste material producers issued a complete account of their efforts to maintain this open market, such an account having been outlined in a recent issue of the PAPER TRADE JOURNAL. This week S. F. Beatty, president of the Printing Trades Secretary-Managers Association, has sent out a bulletin suggesting that the Waste Material Producers Association be permitted to represent the printers of this vicinity at Washington, D. C., so that these interests in waste paper may be fully represented and protected.

# Ontario Paper Manufacturers Fairly Active

## Fine Paper Mills Report Demand Well Maintained, Despite Off Season Due to Approach of Yuletide Holidays—Request for Cover Papers Holding Up Well—Coarse Paper Plants Operating Lightly, With Supplies Moving Slowly

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., December 18, 1933—The month of December is panning out well as far as mill activities in paper manufacturing circles in Ontario go and it is estimated that the tonnage turned out and disposed of, particularly in fine papers, for the last month in the year, will be greater than last year for the same period, with the ratio of profit about the same as last year.

Most of the fine paper mills report that demand is keeping up well despite the fact that this is the off season induced by the near approach of Christmas and the new year. December is a month when mills will operate for about three weeks, while there will be a week or two between the end of the old and the beginning of the new year, when operations will cease while repairs are being made to plants.

Manufacturers of cover papers, tag manilas, and some specialty lines, report that the call for these lines is keeping up well for December, although it is possible that makers of book, bond, writing and ledger papers are not so favorably placed, although the year with them, also, is winding up fairly well.

Manufacturers of course papers are operating lightly and demand has fallen off as the year ends, while the same may be said of paper bags. The sale of kraft wrapping is keeping up well although there is very little export trade in that line.

The year is ending very well for the manufacturers of light weight papers, there being a well sustained demand for all lines of tissues, toilets and fancy crepe papers. On the other hand the paper converting trade is perhaps even quieter than it was during November and December of last year. Envelope manufacturers are only moderately busy and there is a decidedly light call for blanks, books and general stationery lines represented in the paper converting trade.

With the light demand for board by the paper box manufacturers the box board industry is operating at not more than 75 per cent capacity. Paper box manufacturers have been having some Christmas repeat orders but the Christmas business turned up so late this year that it hurt the volume.

Effective December 14 two of the cheaper grades of sulphite papers were increased by half a cent a pound it was learned from the Canadian Paper Trade Association. It is pointed out that pulp has increased $15 a ton since last spring and this has finally caused the increase in the finished product. The new prices will likely remain firm until Spring.

### Wallpaper Firms Doing Well

Sun-tested Wallpapers, Ltd., a recent addition to Toronto's industries, has increased its plant by 11,000 square feet and now occupies the entire building at 1244 Dufferin street, containing a total of 35,000 square feet of floor space. The company is installing an additional wallpaper machine, which will increase the output by 50 per cent. For some time the factory staff has been working both day and night shifts. The company was formed and commenced manufacturing during the past summer. It is affiliated with United Wallpaper Factories Inc., of the United States. H. C. Jarvis is president and general manager.

### Pulp Cutters' Strike Settled

With the Ontario Government playing a prominent part, settlement of three northern pulp cutters' strikes, involving close to 2,000 men, was reached on December 14. From the back woods timber camps, where they were organized to fight for higher wages and better living conditions, the workers walked out about a month ago.

When two hundred Abitibi Power and Paper Company employees cheered the good news at Ansonville that they would start work again on the 15th, the long standing strike was definitely over in the Northern Ontario country. Previously, the Hon. Wm. Finlayson, Minister of Lands and Forests, had announced that terms had been agreed between workers and operators at Cochrane and Port Arthur. Strike leaders said that demands had been about 85 per cent complied with.

Pulp-cutters in the Ansonville section will receive wages of from $28 to $35 a month, or three to five cents a log for piece work. These men paraded through the snow when they walked out, but the Abitibi company announced that they would be taken back to Camp by train and sleigh. Some of the camps are thirty miles distant from Ansonville.

Workers at Cochrane and Port Arthur won concessions in matters of wages and board, while operators were granted a reduction in timber dues by the Government.

Port Arthur district men will receive $2 a single cord and $3.50 a double cord under the new scale, and will be charged 75 cents a day board by the companies instead of 90 cents and a dollar. Mr. Finlayson said the Government had agreed to reduce the dues on spruce pulpwood from $1.40 a cord to $1 a cord for the current year.

## To Be Chief of Trade Association Division

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 20, 1933—General Hugh S. Johnson has appointed Dr. Wilson Compton Chief of the Trade Association Division, NRA.

Under the plan for Code Administration, NRA is seeking to coordinate the facilities of the various industries with those established by the Administration. Practical and fair standards by which the competence of industry associations or their code authorities to act as agencies of self-government are being determined in keeping with the policy of strengthening the permanent association establishment of American industry.

Dr. Wilson Compton has agreed to undertake this work until the means of industrial self-regulation has been firmly established. He is one of the outstanding trade association executives, being general manager of the National Lumber Manufacturers Association and related forest products industry and a member of its Code Authority, Chairman of the Committee on Industry Planning of the American Trade Association Executives, and for some time associated with the Industrial Advisory Board, specializing on Trade Association and Code Authority matters.

# Philadelphia Paper Market Shows Upward Trend

## Betterment of Conditions Resting on More Stable Basis Than During Mid-Summer Movement —Wholesale Paper Merchants Expect to Swing Along on Even Keel—Bond and Ledger Papers in Average Demand for Season—Paper Stock Section Conditions Irregular

PHILADELPHIA, Pa., December 18, 1933—Quite aside from seasonal influences, which have a strong bearing on the current advancement, the trend is upward and the betterment is resting on a more stable basis than during the mid-summer upswing. Box board and cellophane remain strong; news board being quoted at $50 a ton, and chip board at $45. There is good business in box papers, particularly in fancy boxes for candy, etc. Paper stock as a whole is rather dull; however, prices still maintain for the better grades, but offerings for the cheaper grades are nil. Bonds and ledgers are in average demand.

It was reported at the last meeting of the Paper Trade Association that the one house which was outside the Credit Group had come in and now this group is one hundred per cent organized, and it was further said that $20,000 in actual cash has been paid the paper houses to secure the removal of names from the delinquent list; this does not take into consideration people who gave notes and trade acceptances.

With inventory season in the offing, it is believed that some really good business will be available, and the wholesale paper trade will swing along on an even keel.

### Paper and Cordage Merchants Entertain

Several bus loads of kiddies, invited by the Philadelphia Paper and Cordage Association, and recruited from the ranks of the Salvation Army, were given happy hours on Friday last in the Rose Room of the Adelphia Hotel. The room was tastefully decorated, a glittering tree occupying one end of the room. Santa Claus was there in life in the person of C. D. Turner, who in ordinary days is in the organization of Wailes Dove-Hermiston Corporation, at 401 North Broad street. The long banquet tables were so arranged that opposite each little guest there was seated a member of the association who spared no trouble to see that his charge was amply served.

The Rev. Croswell McBee, Pastor of Old Saint Davids, Devon, Pa., invoked benediction, and an invitation to serve as chaplain of the association was accepted by Dr. McBee. Communal singing of Christmas hymns by the children was participated in by the one hundred members of the association and their wives and sweethearts who attended. Mrs. William Horace Brown presiding at the piano, rendered some very choice musical selections. The dinner was further enlivened by members of the orchestra from the Adelphia Hotel who marched up and down and all around the room playing hill-billie songs.

To use the words of President George K. Hooper: "We thought we were going to entertain these children but the fact is they are entertaining us. Just to illustrate, let me say that there occurred a misunderstanding with regard to the date of this Christmas party—the Salvation Army officers being under the impression it was to take place at a later date—but through a trick of fate we discovered this just a day or so ago and were able to carry out our plans, as previously arranged. Now, can you imagine how disappointed we men would have been to have come here and not find these children? Well, that is what I mean to convey when I say these children are entertaining us." Leonard Fitzgerald, a member of the association, won hearty applause by his inimitable recital of "That Old Sweetheart of Mine."

Each small guest, filled to the ears with turkey and all the fixin's, was provided with a bag laden with candy, toys, fruit and a nice warm sweater, after which they bundled themselves into their coats and boarded buses for the trek home. A vote of praise and thanks was given by those attending to Steve Rigoli, banquet manager of the Adelphia.

This being the regular monthly meeting date of the Philadelphia Paper and Cordage association, the following candidates selected by the Nominating Committee, for election to office, were announced: President, George K. Hooper; Vice-President, Amos Coath; Treasurer, Frederick I. Brower; Secretary, H. S. Platt; Directors: Leslie Bartlett; Stanleigh Brower; Dan Crimmins; V. A. Dirvin; J. R. Howarth and E. L. Richards.

### Trade Association Institute Plans

The Trade Association Institute, recently organized with headquarters here, at a dinner at Kugler's Restaurant during the week, anounced plans for extension with the goal of co-ordinating trade association activities for the more efficient administration of industrial practice codes. In outlining the objects of the Institute, Howard P. Beckett, its counsel, who is also commissioner of the National Paper Box Manufacturers Association, declared that much of the confusion delaying approval of codes has been due to failure of the Government, industry and trade association to understand just what was meant by trade associations. Other speakers were William A. Meeks, executive secretary of the Typothetae of Philadelphia, president of the Institute; Warner S. Hays, secretary and treasurer of the Institute, and Harry K. Sorensen, District Compliance Director of the NRA. Donald R. Richberg, general counsel of NRA, later met with the officers of the Institute and expressed hearty approval of its aims and aspirations.

## Paper Mill Payrolls Stolen

TURNER'S FALLS, Mass., December 18, 1933—In a daring robbery, $23,000, representing approximately the payrolls of the Keith Paper Company and the Esleeck Manufacturing Company of this place, was stolen by four armed men from the Crocker National Bank here Wednesday morning. All the money stolen was covered by insurance. W. Johnes Morgan, vice-president of the bank, estimated the amount stolen to be $23,000, all in small bills and change. Several non-negotiable securities were taken also.

The Keith Paper Company and the Esleeck Manufacturing Company obtained their money for the payrolls from the Franklin County Bank and Trust Company and the First National Bank and Trust Company, both of Greenfield, Mass.

## Alex. Israel To Be Production Manager

L. H. Gaetz, president and general manager of Eastern States Carton Corporation, Brooklyn, N. Y., announces the appointment of Alex. Israel, formerly with Central Carton Company, as production manager of Eastern States Carton Corporation.

# Adverse Statements Regarding News Print From Southern Pine Refuted

510 W. River St., Savannah, Ga., Dec. 15, 1933.

EDITOR, PAPER TRADE JOURNAL:

In the issues of Paper Trade Journal of November 30 and December 7, I note the criticisms and comments of southern pine news print reported by your Montreal correspondent. The statements of the unnamed Canadian experts, observers and authorities in the November 30 issue, illustrate the interesting series of changes on the part of the doubters and critics of the experiment here to demonstrate the suitability of Georgia pine for news print.

Until pulp and paper were actually made in the laboratory a few months ago and printed on the presses of the *Savannah Evening Press* at 30,000 copies per hour, it was positively asserted by many experts that it could not be done, since Georgia yellow pines could not be pulped by the sulphite process because of its pitch content—neither could white paper be made from pine ground wood because of the known yellow color of the wood. However, sulphite of satisfactory quality for news print was made, and the groundwood instead of being yellow is as bright as spruce and even brighter.

It was then contended that even if there might be no evidence of pitch in the pulps it would show itself on the paper machine. No pitch trouble being encountered on the laboratory machine, it was then said that they would surely appear if the pine pulps were run over a commercial paper machine. It was also considered altogether doubtful if the paper could be made at normal commercial speeds. These contentions were again disproved by the eight and a half hour run at 740-ft. per minute, without a break or any interruption, at the Beaver Wood Fibre Company, Ltd. plant at Thorold, Ont.

It is now said that in a longer run the pitch troubles might have developed.

As to the news print made entirely from Georgia pine pulps and its printing quality, it was first asserted that if paper could be made the sheet would necessarily be harsh and brittle, would not have sufficient strength for high speed rotary presses, would have low opacity causing show-through, and would require an excessive amount of ink for printing. All these forecasts were disproven very conclusively by the nine daily newspapers in Georgia which used the paper from the commercial run on their regular editions of November 20. The only adverse criticism of the surviving die-hard critics has been that the paper is really too soft and flexible.

Regarding the press performance and printing quality it will be of interest to quote the reports of some of the newspapers:

Clark Howell, editor and general manager of the *Atlanta Constitution,* said, "I was informed by the pressman that he never had a better run in his life. The paper looked fine and exceeded all expectations."

John Paschall, managing editor of the *Atlanta Journal:* "Our early edition printed on Georgia pine was beautifully printed. The paper takes ink well with cuts printing up as well as on paper from other woods we have used. We are delighted with the new paper."

Leonard Roan, managing editor of the *Atlanta Georgian:* "The *Georgian's* first trial of pine pulp paper has been surprisingly satisfactory. The pine paper seemed a bit softer than spruce paper but has a good finish on both sides and is quite strong. One press ran an edition of 20,000 copies without a break. The printing was as good as on spruce paper."

P. T. Anderson, Jr., assistant general manager of the *Macon Telegraph* and *Macon News:* "The press run for this morning's paper was a huge success. The paper far surpassed my expectations as to what it would do. There was apparently no static as has been very annoying for the past few days. The entire run was made without a single break that could be blamed on the paper. The spring was as good as on any other news print. The ink penetration was sufficient to give a good print and yet did not show in white spaces on the reverse side. We found we got sixty-five pages to the pound on paper which is comparable to any other news print. The toughness, yet softness, of the paper was very noticeable. Dr. Herty is certainly to be commended for putting out such a superior product. I am all for it."

W. M. Pryse, managing editor of the *Albany Herald,* said today's edition of the *Herald* was printed on the Georgia news print and "worked to a perfection on our press. There was no break of the web or anything that looked like one. The print was excellent and clear, and left nothing to be desired. Subscribers spoke with pleasure of the soft, smooth texture and whiteness of the new paper. Our experience with Georgia pine news print was more than satisfactory in every way."

The *Brunswick News* reported "great success" with the news print and said, "It went through its full press run without trouble or breaks in the web. No difficulties were experienced and the pressmen were delighted with the print."

Jack Williams, editor and publisher of the *Waycross Journal-Herald,* said, "Our experience with news print made from Georgia pine was eminently successful in every way. The score stands, no breaks, free from static, clear print, perfect ink distribution. In fact, we have never had a more satisfactory run. Another thing about this Georgia paper, while strong enough to avoid breaks, it seems much lighter than the paper we have been using, which will mean a saving in mailing expense. We are ready to contract for Georgia paper exclusively. More power to Dr. Herty and his associates who have made this great feat possible."

Now, since the suitability of Southern pine has been demonstrated and, with great evident reluctance, more or less conceded by the Montreal "authority" according to his reported statement "Broadly speaking, there appears here general recognition of the potentialities of news print manufacture from Southern pine"—this "authority," as well as Mr. Robert P. Kernan, president of Donaconna Paper Company, takes comfort in the belief that it will be at least fifteen years before sufficient pulpwood will be available.

Mr. Kernan says, "According to my information, they get about one cord an acre of regrowth in fifteen years"; and the "authority" states, "For the next decade or so should be considered of relatively little importance. Southern pine for news print uses it is estimated should be approximately fifteen years old but it is indicated by Dr. Herty that younger trees can be used to advantage."

In the first place, as to regrowth, I would refer to Cir-

cular No. 124 of the U. S. Department of Agriculture "Rate of Growth of Second Growth Southern Pines in Full Stands" page 1: As a group the four chief Southern pines rank among the most rapidly growing commercial trees of the United States. . . . On average soils full stands of second growth longleaf pine produce in 20 years 15 cords of pulpwood to the acre from trees 4 inches in diameter and up; shortleaf pine in the same time 18 cords, loblolly pine 28 cords, and slash pine 36 cords—"

Farmers' Bulletins No. 1486 Longleaf; No. 1671 Shortleaf; No. 1517 Loblolly; and No. 1256 Slash Pine confirm these figures of rate of regrowth and also show the wide area of distribution of these pines. So, instead of Mr. Kernan's one cord per acre regrowth in fifteen years, it is really, on a very conservative estimate, fifteen times as great. So far from the necessity to wait fifteen years before pulpwood suitable for news print is available is concerned, there are at the present time millions of acres covered with regrowth fifteen years and under. And if Mr. Kernan and other doubters would come to Savannah they could see thousands of acres close by with more than 15 cords per acre of ten to twelve year old trees.

Discussing the other economic factors of labor, location in respect to markets, and power, Mr. Kernan concedes to the South the advantage as to labor cost and equality in transportation by rail to the chief market centers and by water to the eastern seaboard cities. In this concession of equality to northern and northeastern points I would like to inquire of Mr. Kernan if $3 per ton of paper would represent the average transportation cost from Canadian plants to eastern seaboard cities.

Regarding power for news print manufacture, both the Montreal "authority" and Mr. Kernan are evidently of those who could confer at advantage with John Stadler, the well-known Canadian paper mill engineer, who wrote a few months ago in *Pulp and Paper* "Three decades ago the water power was the factor that determined the location. Paper mills are no longer dependent on electric power generated from water power." It is well enough known not to require argument that with favorable fuel cost and a modern steam plant efficiently operated, the cost of electric power generated from steam can compete with that of the average hydro-electric plant. In addition, there are still numerous water power sites in the South awaiting development.

To conclude, Mr. Kernan and the Canadian authorities should not overlook the potentialities of the Tennessee Valley for news print with its short leaf pine and Muscle Shoals power.

At fifteen years Farmers Bulletin 1671 shows a yield of twelve cords of peeled wood per acre on good land. Wilson Dam at Muscle Shoals is said to have a capacity of 612,000 horsepower when completed. If it were possible to produce all the news print at present imported on the circle of a two hundred mile radius from Muscle Shoals it would take the entire output of Wilson Dam.

W. G. MACNAUGHTON.

# Lake States Section of TAPPI Meets at Appleton

The December meeting of the Lake States Section of the Technical Association of the Pulp and Paper Industry was held at the Hotel Conway, Appleton, Wis., on Tuesday, December 12, at 6:00 p.m., R. J. LeRoux of the Consolidated Water Power and Paper Company presiding as chairman.

### Abrams Reports West Coast Trip

The guest of honor was Allen Abrams, National President of TAPPI, who has just returned from a trip to the Pacific Coast, where he attended the meeting of the Pacific Coast section of TAPPI at Tacoma, Wash. Mr. Abrams urged the members to attend the next fall meeting to be held in Portland, Oregon, next September. He pointed out that this was an opportunity to visit the modern Western mills, as well as to combine business with pleasure by seeing the Western forests and scenery.

### Wood Room Machinery and Alkali Recovery

Two interesting papers were presented. The first was by C. L. Durkee, of D. J. Murray Manufacturing Company, Wausau, Wis., on "Wood Room Machinery and Alkali Recovery." This paper was a description of mill equipment developed and manufactured by the D. J. Murray Company. The units covered included drum barkers, wood cleaners, chippers, rechippers, alkali recovery units, and the Dunbar flat screen drive. Slides were used to illustrate the various machines.

### Chemipulp Process

"The Chemipulp Process: Hot Acid Recovery with Forced Circulation" was described by F. H. Johnson, Jr., of the Chemipulp Process Company, Inc., Wisconsin Rapids, Wis. The paper described the installation, emphasized the savings, and outlined the necessary maintenance. By this process mills have made substantial savings in lime, sulphur, and steam, have shortened cooking time, and have obtained increased yields of a stronger, more uniform, and easier bleaching pulp.

### Those Who Attended

Lively discussion followed both papers. Well over one hundred members were present. Among these were:

Allen Abrams, Marathon Paper Mills Company, Rothschild, Wis.

A. W. Agrell, Patten Paper Company, Kaukauna, Wis.

Frank Aldrich, Interlake Paper Mills, Appleton, Wis.

Louis J. Allard, Hoberg Paper and Fibre Company, Green Bay, Wis.

Martin J. Auchten, Hoberg Paper and Fibre Company, Green Bay, Wis.

A. E. Bachman, Kimberly-Clark Corporation, Neenah, Wis.

A. W. Barton, Horton Manufacturing Company, Minneapolis, Minn.

Harold Bialkowsky, Gilbert Paper Company, Menasha, Wis.

G. C. Brabender, Marathon Paper Mills, Rothschild, Wis.

Russel Brenzel, Thilmany Pulp and Paper Company, Kaukauna, Wis.

Earl Bryant, Institute of Paper Chemistry, Appleton, Wis.

L. F. Bunde, Hoberg Paper and Fibre Company, Green Bay, Wis.

Glenn Carroll, Combined Locks Paper Company, Appleton, Wis.

C. W. Cassell, Institute of Paper Chemistry, Appleton, Wis.

Walter C. Christensen, Hoberg Paper and Fibre Company, Green Bay, Wis.

Richard C. Crain, Institute of Paper Chemistry, Appleton, Wis.

Roy Davis, Consolidated W. P. & P. Company, Appleton, Wis.
E. E. Den Dooven, Hoberg Paper and Fibre Company, Green Bay, Wis.
Anton De Laarschat, Hoberg Paper Company, Green Bay, Wis.
C. L. Durkee, D. J. Murray Manufacturing Company, Wausau, Wis.
Frank B. Eilers, On Felt and Blanket Company.
J. R. Fanselow, Kimberly-Clark Corporation, Kimberly, Wis.
A. T. Gardener, Combined Locks Paper Company, Combined Locks, Wis.
John Gerhauser, Appleton, Wis.
LaVerne Gilbertson, Institute of Paper Chemistry, Appleton, Wis.
Thomas M. Gillespie, Pennsylvania Salt Manufacturing Company, Chicago, Ill.
E. P. Gleason, Nekoosa-Edwards Paper Company, Port Edwards, Wis.
Arthur E. Gruening, Marathon Paper Mills Company, Rothschild, Wis.
Herb Heilig, Appleton, Wis.
C. W. Holt, Diamond Alkali Company, Pittsburgh, Pa.
Walter Holzer, Institute of Paper Chemistry, Appleton, Wis.
M. H. Haskins, Hoberg Paper and Fibre Company, Green Bay, Wis.
E. S. Jacobi, Green Bay, Wis.
Earl H. Johnson, Northern Paper Mills, Green Bay, Wis.
F. H. Johnson, Jr., Chemipulp Process, Inc., Wisconsin Rapids, Wis.
Ralph Kehe, Kimberly-Clark Corporation, Neenah, Wis.
M. J. Ketter, Hoberg Paper and Fibre Company, Green Bay, Wis.
Robert E. Kissel, Hoberg Paper and Fibre Company, Green Bay, Wis.
Gus Klaus, Northern Paper Mills, Green Bay, Wis.
Wm. Fitzgerald, Northern Paper Mills, Green Bay, Wis.
Wm. K. Kolb, Combined Locks Paper Company, Combined Locks, Wis.
Otto Kress, Institute of Paper Chemistry, Appleton, Wis.
H. L. Krieger, Thilmany Pulp and Paper Company, Appleton, Wis.
Lloyd Lany, Kimberly-Clark Corporation, Neenah, Wis.
B. E. Lauer, Northern Paper Mills, Green Bay, Wis.
E. M. Leavitt, Thilmany Pulp and Paper Company, Kaukauna, Wis.
E. F. Lenz, Hoberg Paper and Fibre Company, Green Bay, Wis.
H. P. Madsen, Appleton Machine Company, Appleton, Wis.
I. R. McCall, Michigan Steel Casting Co., Detroit, Mich.
G. H. McGregor, Institute of Paper Chemistry, Appleton, Wis.
James McIntyre, Institute of Paper Chemistry, Appleton, Wis.
G. C. McNaughton, Institute of Paper Chemistry, Appleton, Wis.
Ernest B. Morse, Appleton, Wis.
R. A. Nugent, Nekoosa-Edwards Paper Company, Port Edwards, Wis.
C. H. Nystrom, Northern Paper Mills, Green Bay, Wis.
P. A. Paulson, Appleton, Wis.
D. E. Porter, Kimberly-Clark Corporation, Neenah, Wis.
William Prebbanow, Consolidated W. P. and P. Company, Appleton, Wis.
Jos. Quell, Interlake Pulp and Paper Company, Appleton, Wis.
Charles Roth, Institute of Paper Chemistry, Appleton, Wis.
Robert Rusch, Institute of Paper Chemistry, Appleton, Wis.
C. E. Saecker, Appleton Machine Company, Appleton, Wis.
H. A. Schauer, Hasco Valve and Machine Company, Milwaukee, Wis.
C. K. Seaborne, Thilmany Pulp and Paper Company, Kaukauna, Wis.
L. E. Smith, Nekoosa-Edwards Paper Company, Port Edwards, Wis.
Robert Smith, Northern Paper Mills, Green Bay, Wis.
Geo. H. Spencer, E. D. Jones and Sons Company, Pittsfield, Mass.
Harold Sperka, Institute of Paper Chemistry, Appleton, Wis.
F. J. Stoar, Stebbins Engineering and Manufacturing Company, Watertown, N. Y.
W. H. Swanson, Kimberly-Clark Corporation, Neenah, Wis.
M. J. Taylor, Hoberg Paper and Fibre Company, Green Bay, Wis.
E. W. Ferguson, Horton Manufacturing Company, Minneapolis, Minn.
William Thiele, Consolidated W. P. and P. Company, Wisconsin Rapids, Wis.
Erwin J. Vickman, Hoberg Paper and Fibre Company, Green Bay, Wis.
Edward H. Voigtman, Kimberly-Clark Corporation, Neenah, Wis.
Charley L. Wagner, Marathon Paper Mills Company, Rothschild, Wis.
Dan Wicker, Institute of Paper Chemistry, Appleton, Wis.
T. E. Xistris, Valley Iron Works Co., Appleton, Wis.
M. A. Youtz, Northern Paper Mills Company, Green Bay, Wis.

## Bids on Government Paper

WASHINGTON, D. C., December 20, 1933—The Government Printing Office has received the following bids for 38,250 pounds of white sulphite writing paper: Cauthorne Paper Company, Inc., at 4.64 cents per pound; Old Dominion Paper Company, 5.449 cents; Perkins-Goodwin Company, 4.08 cents; Aetna Paper Company, 5.75 cents less 3%; R. P. Andrews Paper Company, 5.5 cents; Whitaker Paper Company, 4.475 cents; Dobler & Mudge Company, 5.5 cents; Mathers-Lamm Paper Company, 5.617 cents; Mudge Paper Company, 6 cents, and Charles G. Stott & Company, Inc., 5.75 cents.

For 20,000 pounds of green calendered tag board: Barton, Duer & Koch Paper Company, 7 cents per pound.

For 143,500 pounds of white sulphite bond paper: Cauthorne Paper Company, at 6.19 cents per pound; Aetna Paper Company, 6 cents less 3%; Whitaker Paper Company, 5.7 cents; Perkins-Goodwin Company, 5.15 cents; Reese & Reese, Inc., 5.68 cents; Barton, Duer & Koch Paper Company, 5.75 cents, and R. P. Andrews Paper Company, 5.75 cents.

For 40,000 pounds of white sulphite writing paper in 21-inch rolls: Aetna Paper Company, 5.75 cents less 3%; Cauthorne Paper Company, 4.42 cents; Whitaker Paper Company, 5.15 cents; R. P. Andrews Paper Company, 5.24 cents; Dobler & Mudge Company, 5.1 cents; Perkins-Goodwin Company, 3.87 cents; Stanford Paper Company, 4.25 cents.

# Delaware Valley TAPPI Discuss Drying

About sixty members of the Delaware Valley Section of the Technical Association of the Pulp and Paper Industry met at the Engineers Club, Philadelphia, Pa., on Friday evening, December 15. G. E. Landt of the Continental Diamond Fibre Company presided as chairman.

S. W. Fletcher, Secretary of the J. O. Ross Engineering Corporation discussed "Drying, Conditioning and Ventilating." Mr. Fletcher pointed out that it is more economical to remove water mechanically by means of press rolls and felts than it is to evaporate it out on the driers. In general there are about two tons of water evaporated for each ton of paper dried.

Particular emphasis on the value of a good ventilating system was given since it is quite as important to get the evaporated water away from the sheet surface as it is to remove it from the content of the sheet. The Grewin system as a means of producing proper air circulation was described. When there is no hood about 50 per cent more air circulation is required.

Mr. Fletcher predicted that eventually all modern machines will be completely enclosed by means of hoods and curtains.

The Briner Economizer was described and it was shown that mills using a natural draft rather than forced air circulation were losing money. Careful control of ventilation will prevent improper moisture condensation on roofs and walls and will reduce heat losses.

C. M. Connor of the Valley Forge Laboratories read a paper prepared by Prof. Ralph H. McKee of Columbia University and J. S. Shotwell of Ottawa, Ontario, on "Some Recent Developments in the Moisture Control of Paper." It was indicated that the moisture content of paper follows the absolute humidity much more closely than it does the relative humidity and that the variation with temperature is much less marked in the former case.

It was stated that printers have found that a paper with a moisture content from 8.5 to 10 per cent will give the best results.

If paper is first slightly overdried and then conditioned by passing it rapidly through an atmosphere containing about 17 grains of water per cubic foot at 95 deg. F. the moisture content will be increased and the variations reduced, because the greatest "pick up" will occur when the original moisture content is least and vice versa. The time required for this is but a few seconds. Devices and procedures for getting this result efficiently and economically were described.

Those present included: S. M. Hesser, Hinde & Dauch Paper Company, Gloucester, N. J.; L. F. Derr, Philadelphia; L. I. Stein, Simcoe Manufacturing Company; John Roslund, Moore & White Company, Philadelphia; Fred Streicher, Dill & Collins Inc., Philadelphia; G. B. Martin, General Dyestuff Corporation, Philadelphia; G. W. Roberts, General Electric Company, Philadelphia; Samuel D. Reynolds, Container Corporation of America, Manayunk, Pa.; W. D. Macgeorge, Container Corporation of America, Manayunk; Jacob Edge, Downingtown Manufacturing Company, Downingtown, Pa.; S. W. Fletcher, J. O. Ross Engineering Corporation, New York; C. A. Shubert, Dill & Collins Inc., Philadelphia; G. D. Landt, Continental Diamond Fibre Company, Bridgeport, Pa.; R. G. Macdonald, Secretary of TAPPI, New York; J. C. Harper Jr., West Jersey Paper Manufacturing Company, Camden, N. J.; H. P. Cannon, Container Corporation of America, Manayunk; T. K. Cleveland; L. J. Neunier, Kieckhefer Container Company, Delair, N. J.; F. E. Winslow, General Electric Company, Philadelphia; E. J. Albert, Thwing Instrument Company, Philadelphia; W. M. Shoemaker, National Vulcanized Fibre Company, Yorklyn, Delaware; Leslie Justin, Container Corporation of America, Manayunk; W. T. Marble, Container Corporation of America, Manayunk; C. J. Kern, Moore & White Company, Philadelphia; E. E. Helm, Reliance Electric and Engineering Company; F. J. McAndrews, McDowell Paper Mills, Manayunk; C. W. Rivise, Philadelphia; H. D. Cook, Dill & Collins Inc., Philadelphia; H. C. Schwalbe, Dill & Collins Inc., Philadelphia; James d'A. Clark, Scott Paper Company, Chester, Pa.; H. H. Hanson, W. C. Hamilton & Sons, Miquon, Pa.; A. W. Wickham, MacAndrews & Frobes Co., Camden, N. J.; G. R. Heidrich, Wallace & Tiernan Inc., Philadelphia; M. C. Maxwell, McDowell Paper Mills, Manayunk, Pa.; J. C. Dieffenderfer, Paper Makers Chemical Corporation, Easton, Pa.

## More Pulp for Port of Albany

ALBANY, N. Y., December 11, 1933.—Announcement was made this week that another paper company has been attracted by the excellent advantages offered by the local port terminal and the past week inaugurated a movement of direct shipments of wood pulp here from a New Brunswick port. Arrangements are said to have been made by the Port Royal Paper Company, under which two shipments will arrive here each month for customers in this district. The company owns a fleet of its own steamers and is said to be impressed with the good facilities offered at the local port. Numerous other cargoes have reached here during the past few years from Canadian shipping centers but the consignment of pulp wood was the initial shipment from a New Brunswick port. The increased activity at the local terminal has resulted in plans for expansion of facilities and it is now predicted that the end of the year will witness a shattering of all previous records in pulp wood shipments to this port.

It was reported here this week that a huge movement of pulp wood from Sweden was scheduled to arrive at the local port within the next few days. Four vessels are enroute here and each are carrying several thousand tons of the imported product. It is understood that these shipments are destined to go to the mills of the Union Bag and Paper Company, Hudson Falls, inasmuch as previous contracts placed by the concern have come from this source. A total of about 22,000 tons of the Swedish product is scheduled to arrive here within the next few days. In order to take care of this movement port officials have been extremely active in preparing space in the warehouses while work has also began on the construction of a new addition.

Shipments during the past month have broken all previous records for this season of the year and marine men pointed to the fact that the size of the cargoes are just about double those of a year ago.

## Paper Code Authorities

WASHINGTON, D. C., December 20, 1933—General Johnson has announced the following appointments of the NRA members of code authorities in the paper industry:

For paper and pulp, W. W. Pickard and Charles Addoms.

For newsprint paper, W. W. Pickard and Roy C. Holliss.

For paperboard, W. W. Pickard.

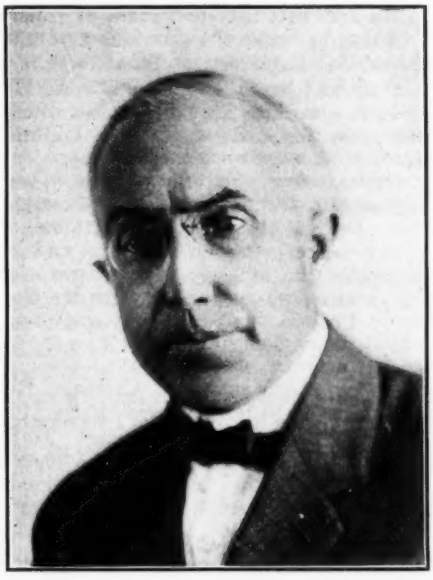
# Obituary

### James A. Cameron

After a brief illness James A. Cameron, president and director of the Cameron Machine Company, died shortly after midnight of Wednesday, December 13. There will be many in the paper industry who will be shocked and grieved to hear of his passing.

Mr. Cameron founded the Cameron Machine Company in 1906 and ever since has taken an active interest in the problems of the paper industry in so far as slitting and roll-winding are concerned.

The slitting and roll-winding problems of the textile industry also commanded his attention and during the war



JAMES A. CAMERON

his company developed a semi-automatic high speed bandage slitting machine. He also established the Cameron Machine Company of Canada Ltd. at Dundas, Ontario.

Mr. Cameron was born in Brooklyn, a son of John Franklin Cameron a linen importer and native of Scotland and the late Dr. Elizabeth Cameron, a physician. He attended school in Dublin, Ireland and studied at the University of Edinburgh before going to the Brooklyn Polytechnic Institute from which he was graduated with an A.B. Degree, in 1896.

Mr. Cameron was active in civic affairs and at the time of his death was a member of the Board of Trustees of the Brooklyn Public Library. He was also a former president of the Brooklyn Polytechnic Institute Alumni Association, which he helped to organize several years ago.

He was a former member of Troop C, a Brooklyn cavalry unit, and also a former member of the University Club and the Crescent Athletic Club, now combined as the Crescent Athletic-Hamilton Club.

Many prominent persons attended the funeral services at St. Ann's Episcopal Church in Brooklyn on Friday, December 15. The Rev. Dr. Samuel Dorrance officiated. Burial was in the Barratts Chapel Cemetery, near Frederica, Delaware.

Among those present at the services were John H. McCooey, Supreme Court Justice and Mrs. George E. Brower, former Judge and Mrs. Edwin L. Garvin, George Whitlock and Arthur Bennett of the National City Bank, Mr. and Mrs. George A. Mendes, Mr. and Mrs. William P. Earle, Jr., Mr. and Mrs. Henry R. Lathrop, Dr. Roscoe C. E. Brown, Walter Hammitt, Supreme Court Justice and Mrs. Paul Bonynge, Otis Swan Carroll, Charles E. Rogers, John Cornell, Dr. and Mrs. O. Paul Humpstone, Peter Hamilton, Lewis W. Francis and Miss Mary Francis, H. C. Kinsey and John G. Winderhill.

### Walter H. Bissell

APPLETON, Wis., December 1[illegible] 1933—Walter H. Bissell, aged 75, one of the founders of the Marathon Paper Mills Company, of Rothschild, Wis., died last week at his home at Wausau, Wis. He had been ill for ten years with paralysis, and was confined to his bed for the last fourteen months. In spite of his handicap, he was at his office for many years in a wheel chair directing his business enterprises. Burial was made at Wausau.

Mr. Bissell was a pioneer in the lumber industry of Wisconsin, and one of the largest timber and sawmill operators. He was best known through his connection with the Yawkey-Bissell Lumber Company, of Wausau, as secretary and manager. He also organized and was president of the Wausau Southern Lumber Company and the Marathon Lumber Company, both Wisconsin corporations doing business at Laurel, Miss.

When the possibilities of paper manufacture as an outlet for timber resources of the Wisconsin River Valley were realized, he joined with other Wausau capitalists in organizing the Marathon Paper Mills Company, one of the major paper corporations of Wisconsin. He served on its original board of directors and was associated with the company in that capacity for many years. He was also prominent in banking circles, and his timber holdings were an important source of pulp wood supply for various mills.

### Wesley A. Brooks

APPLETON, Wis., December 18, 1933—Wesley A. Brooks, aged 64, whose death was briefly mentioned in last week's issue of the PAPER TRADE JOURNAL, was born in Cheshire, Conn.

Mr. Brooks came to Menasha in 1912. He became affiliated with the Menasha Printing and Carton Company and later became its secretary.

When the company was absorbed by the Marathon mills he was retained in an executive capacity in the sales department.

He was a past president of the Menasha Club, a charter member of North Shore Golf Club, member of John A. Bryan Lodge of Masons, and junior warden of St. Thomas Episcopal Church.

### Willard F. Smith

PITTSFIELD, Mass., December 18, 1933—Willard F. Smith, retired president and treasurer of the Smith Paper Company of Lee, with which he was identified for thirty years, died suddenly in New York last week. He was 58 years of age. He lived at the Savoy Plaza when in New York. His Summer home was at Ledgeland, Lee.

Mr. Smith was a member of a family associated with the paper industry at Lee for nearly a hundred years. He was born in that town, the son of the late DeWitt S. and Jennie G. Smith.

Upon his graduation from Cornell in 1896 he entered the employ of the Smith Paper Company, founded by a great-uncle, Elizur Smith, and of which his father was president. Willard retired from the concern in 1927, when it went into the control of the British-American Tobacco Company.

## Meyers-Mesco Viscosity Regulator

Viscosity is the degree of fluidity of liquids or semi-liquids and is made visibly apparent by resistance to flow. The numerical degree of viscosity may be determined by any of the several laboratory instruments in general use. In the manufacture and use of the myriad viscous materials encountered in all industries, viscosity plays a critical and active part.

In presenting the equipment described the necessity is recognized for a viscosity responsive device sufficiently rugged to handle commercial volumes of material reliably, and sufficiently sensitive to control or indicate relative viscosity accurately. This unit is a logical out-growth of highly successful consistency regulating equipment placed on the market by us several years ago and now recognized by the paper and pulp industry as the leader in its line.

U. S. and foreign patents

The particular unit here illustrated is a viscosity regulator designed to regulate automatically and continuously the viscosity of electrical wire insulating varnish at a large eastern electrical manufacturing plant. The varnish is constantly circulating, and tends to become heavier, due to natural evaporation of highly volatile solvents. The extremely delicate nature of the coating and the covering perfection demanded, make automatic regulation an imperative necessity.

The viscosity regulator, like the well known consistency regulator for pulp and paper stock, receives its regulating impulse from a slowly revolving agitator suspended in the liquid to be regulated. Any increase or decrease in viscosity, as reflected by varying agitator rotative resistance, is transmitted by sensitive mechanical means to a needle valve which admits just enough thinning solvent to maintain a constant viscosity within very close limits. It is by reason of a unique mechanical transmission that its accuracy is unapproached by manual control, and is fully comparable with laboratory viscosimeter control. Furthermore, laboratory control is intermittent, while Meyers-Mesco Control is constant. The user of these machines reports substantial savings.

While the illustration shown here is a special application to a specific problem and while each problem requires an analysis to determine its proper adaptation to details, the instrument itself is standard and of wide application.

This is not a laboratory instrument. It is a strong, rugged, but highly sensitive machine that will regulate viscosity just as reliably as steam pressure is regulated; or that will record viscosity just as reliably as steam flow or electrical current is recorded.

The technologist and operating supervisor will appreciate that careful consideration should be given to each and every problem. The Merritt Engineering and Sales Company of Lockport, N. Y., therefore, solicits inquiries and asks that samples of material be submitted, if at all possible, giving any and all information pertinent to the problem.

## Completes 52 Years of Papermaking

[FROM OUR REGULAR CORRESPONDENT]

BALDWINSVILLE, N. Y., December 18, 1933.—Charles Arkland, who holds a prominent position here with the National Cellulose Company, has completed what he humorously calls his "first fifty-two years of papermaking." He discloses that he began his career as a youth with the Genesee Paper Co., Rochester, and that there is a big improvement in present working day conditions. He pointed out that he is now working six hours a day which is a big improvement over the early days. He said that paper making plants in those days depended more on streams for water power energy than they do now and consequently seasonable conditions determined the steadiness of employment. During his career Mr. Arkland has been connected with many prominent concerns and he is well known throughout the industry in Northern New York. For several years he was connected with the Sonoso Paper Company, Phoenix, and also previously worked for the Arrowhead Paper Company, Fulton. Some of his other connections during the past century include positions with paper-making plants at Dexter, Carthage, Harrisville, Piercefield, Newton Falls, Niagara Falls, Plattsburg, Malone, AuSable Forks and Chateaugay. He has also held prominent positions with mills in the New England States. In calling attention to the improvement in employment conditions he related that while serving with the Cunningham Paper Company, Plattsburg, he began his duties one week at 7 A.M. and was relieved at 6 P.M. the next Thursday.

## Everett Pulp & Paper Co. Changes

Augustus Johnson, representative of the Everett Pulp and Paper Company with headquarters in San Francisco, Cal., has resigned. In this connection the company has sent out the following announcement:

"J. L. Murray, who for the past several years has been our director of sales promotion, will now assume the responsibility of sales manager, in charge of our entire sales organization, with headquarters at our mill at Everett, Wash.

"John T. Pope, who has been assistant to Mr. Johnson in our San Francisco office for several years, will be our sales representative in San Francisco. H. W. Anderson will continue with us as Mr. Pope's assistant.

"Our Los Angeles representative, A. A. Ernst, and our Harvey E. Stewart and Jerry LeCuyer in the Northwest will continue to represent us as heretofore."

## H. A. Nielson, Jr. Joins W. L. Jones, Inc.

H. A. Nielson, Jr. has joined the sales staff of W. L. Jones, Inc., paper, 116 Prince street, New York, N. Y. Before making this connection, Mr. Nielson had been in the newspaper line and has numerous friends in this business. He will specialize in dealing direct with publishers and newspapers.

# CONSTRUCTION NEWS

*A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills*

**Construction News**

**Emeryville, Cal.**—The Western Waxed Paper Company, 63rd street, has super-structure under way for new one-story addition, totaling about 10,000 square feet of floor space, and will have unit ready for occupancy at early date. It is estimated to cost about $25,000, with equipment. General contract recently was let to A. T. Beckett, 224 Scenic avenue, Piedmont, Cal.

**Brooklyn, N. Y.**—William W. Fitzhugh, Inc., 14th avenue and 37th street, manufacturer of folding paper boxes, labels and kindred paper products, has arranged for lease of about 35,000 square feet of floor space in Flatbush Industrial Terminal, location noted, and will occupy for expansion in output.

**Machias, Me.**—Fire, December 13, partially destroyed the local Hallway and Phoenix Mills of the Seaboard Paper Company, with loss reported at close to $20,000. No announcement has been made regarding rebuilding.

**Peoria, Ill.**—The Muirson Label Company, Inc., 5827 Ridge avenue, Chicago, Ill., manufacturer of paper labels and kindred paper products, has arranged for operation of a new branch paper converting plant at Peoria, where property recently was taken over. Production will begin at early date. The new unit will be used primarily for label manufacture for the liquor trades.

**Chicago, Ill.**—Brunt & Co., Inc., recently organized by John Brunt and associates, to manufacture fiber and corrugated paper containers, lately referred to in these columns, has concluded arrangements for a ten-year lease of new factory, now in course of erection at Newland avenue and West 65th street, Clearing Industrial District. It will be one-story, brick and mill construction, and is scheduled for completion in January, when the Brunt company will install machinery and start operations. Large output is planned. Entire project will represent an investment of about $100,000, including equipment.

**Long Island City, N. Y.**—The Clover Paper Box Company, Inc., 39 West 19th street, New York, N. Y., manufacturer of paper boxes and containers, has arranged for lease of ground floor in building at 44-02 33rd street, Long Island City, and will occupy at once for new plant. Property totals about 13,000 square feet of floor space. Expansion in output will be arranged at new location.

**Green Bay, Wis.**—The Fort Howard Paper Company has work under way on new one-story power house at local mill, 30 x 60 feet, for which general contract was recently let to Selmer & Company, Green Bay. It is expected to have unit ready for equipment installation at early date. W. L. Fergus & Company, 51 East Grand avenue, Chicago, are engineers.

**Brooklyn, N. Y.**—Foster & Cross, Inc., recently organized with capital of $50,000, is said to be planning early operation of new local plant for manufacture of cartons and kindred boxes and containers. New company is headed by Alfred E. Foster, Jr., 105 Lexington avenue, and Charles E. Cross, same address, both Brooklyn.

**New York, N. Y.**—The Tubize Chatillon Corporation, 2 Park avenue, manufacturer of cellulose rayon products, with main mills at Rome, Ga., and Hopewell, Va., is arranging for a bond issue of $5,000,000, to be sold in series from time to time in the future, portion of fund to be used for expansion. Company has concluded negotiations for purchase of property of the Janome Rayon Corporation, 56 Bogert street, Brooklyn, N. Y., including machinery and equipment, and will remove the latter at once to its mill at Hopewell, where extensions will be carried out for increased manufacture. It is expected to have the work completed early in January. J. E. Bassill is president of purchasing company.

**Long Island City, N. Y.**—Ozalid Corporation, Long Island City, manufacturer of sensitized paper products, has leased a floor in local building at 46-42 and 44 11th street, and will occupy at once for new plant, providing machinery and equipment for sizable production.

**Brooklyn, N. Y.**—The Transparent Container Corporation, recently chartered under state laws with capital of $20,000, plans operation of local plant for manufacture of paper boxes and containers, and other special packing devices. New company is represented by Morris S. Gottesman, 270 Broadway, New York, N. Y.

**Marcus Hook, Pa.**—Congoleum-Nairn, Inc., Belgrove drive, Kearny, N. J., manufacturer of floor covering compositions, felts, etc., has plans for new large addition to mill at Marcus Hook, to be one and four-story and basement, 58 x 400 feet, reported to cost over $75,000, with equipment. It is proposed to begin superstructure at early date. W. W. Lindsay & Company, Harrison Building, Philadelphia, Pa., are engineers.

**New York, N. Y.**—The Progressive Fibre Specialty Company, 149 Wooster street, manufacturer of fibre products, has leased a floor in building at 15-17 West Eighteenth street, and will occupy for expansion.

**Nanking, China**—The Ministry of Industry, Chinese National Government, Nanking, has authorized plans for a new pulp and paper mill, to be operated as a Government project, primarily for the production of newsprint. A site will be selected at once. Plant will consist of several units, with power house, machine shop and other mechanical buildings. Machinery and equipment will be purchased for large output. Entire project is reported to cost over $1,000,000, with equipment.

**Toronto, Ont.**—Dominion Boxboards, Ltd., manufacturer of paperboard products, will carry out an expan-

sion and improvement program in power department for increased capacity. Contract recently has been placed with C. A. Parsons & Co., Ltd., Newcastle, England, for a new electric generator set, and auxiliary equipment will soon be selected. Program is scheduled to proceed early in the coming year.

**New Companies, Etc.**

**Haverhill, Mass.**—The Essex Bag Company has been incorporated with capital of $25,000, to manufacture and deal in paper bags and kindred containers. George Alvanos, 155 Primrose street, Haverhill, is president and treasurer.

**Philadelphia, Pa.**—James S. Barber's Sons, 21 North Fourth street, have filed notice of company organization, manufacturing and dealing in paperboard and kindred paper products. Ellwood W. Barber, Collingswood, N. J., is head.

## Resume Pulpwood Operations in Adirondacks

[FROM OUR REGULAR CORRESPONDENT]

CARTHAGE, N. Y., December 18, 1933.—A number of the prominent pulpwood contracting firms have resumed lumbering operations in the Adirondacks this winter after being forced to cease activities for some time. It is understood that Finch, Pruyn & Co., of Glens Falls, will cut about 25,000 cords of pulpwood in Newcomb this winter. The Racquette River Paper Company is also expected to again take advantage of the good lumbering conditions and only several months ago the concern received an excellent supply from the Adirondacks for its Unionville plant. Last year virtually little timber was cut in this section because of economic conditions but improvement in business has started a revival of old times. Announcement was made by the Sisson-White Company that a resumption in operations is now under way but the concern does not plan to take any pulpwood contracts this year. Its shipments will depend to a great extent upon conditions governing the retail hardwood business. It was also learned that about 2,000 feet of timber is to be cut near Tupper Lake and this work is being done mostly through contracts with jobbers. Within the past few years there has been a tendency on the part of prominent paper mills in Northern New York to abandon the Adirondacks for securing pulpwood and the big log drives are mostly past history. Competition from foreign countries has been keen and Russian pulpwood is being rushed to this country in large quantities.

## Republic Issues New Flow Meter Catalog

With a radical improvement in design and construction which stresses the "cartridge sealed element" as a new principle in meter design and assembly the Republic Flow Meters Company, 2240 Diversey Parkway, Chicago, has issued an informative new 24 page catalog, No. 700. This new bulletin describes the principle of the electric resistance type of flow measurement, and presents a completely illustrated description of the cartridge sealed element principle of instrument mounting wherein each actuating mechanism is mounted individually as a separate, sealed element which may be mounted or removed from the back of the instrument panel without disturbing any other element.

Fully illustrated, this catalog shows the modern reading instruments having the charts, indicators and integrators mounted nearly flush with the front of the instrument panel. Much information is presented that will be of practical value to engineers confronted with the problems of flow measurement.

## Charge "Freeze Out" in Pulp Merger

Charging a "freeze out" of minority stockholders of the Soundview Pulp and Timber Company of Everett in the proposed merger of that corporation with the Rainier Pulp and Paper Company of Shelton and the Olympic Forest Products Company of Port Angeles, three minority stockholders yesterday asked the Snohomish County Superior Court for an injunction to block the $11,000,000 consolidation, says the Times of Seattle, Wash.

John E. Ryan, Jr., of the Seattle law firm of Ryan, Askren & Ryan, filed the complaint and petition in Everett. Plaintiffs are Kristine Thomle, Harry Hieberg and Alpha Altenburg, acting for "themselves and other minority stockholders."

Defendants are officers and trustees of the holding company, H. H. Fair, president; U. M. Dickey and Walton N. Moore, vice presidents; Donald G. Sherwin, secretary, and W. Z. Kerr, attorney and assistant secretary; Stuart L. Rawling, Walter A. Starr, C. P. Carruthers, Selah Chamberlain, Robert G. Hooker and C. L. G. Miller, trustees.

The defendants deny there is any "freeze out."

The merger was voted December 5 at meetings of stockholders in Everett, Seattle and San Francisco.

The complaint charges a "freeze out" provision was inserted in the articles of incorporation of the Soundview company without the knowledge and consent of the plaintiffs, the provision being that the company may sell any or all of its assets at any meeting of the board. The suing stockholders say this provision will deprive them of their property without due process of law, unless the merger is restrained.

The value of the assets of the companies in the merger are given in the complaint as $6,403,818, or 53.51 per cent, for the Soundview company; $2,696,219, or 22.52 per cent, for the Rainier Company, and $4,118,096 less a mortgage of $1,250,000, leaving a net of $2,868,096, or 23.96 per cent, for the Olympic company.

Unless the merger is blocked by the courts, the complaint says, the plaintiffs will be damaged and their property rendered worthless, for in the holding company, the Soundview stockholders are allowed only 34.55 per cent, or 171,585 shares of the stock, the Rainier company, 40.28 per cent, or 200,000 shares, and the Olympic company, 25.17 per cent, or 125,000 shares.

"Certain stockholders of the Olympic and Rainier companies dominate the Soundview company, and are using the unencumbered assets of this company to bolster, strengthen and save the other two companies for personal benefit and to the detriment of the minority stockholders of the Soundview company, under the guise of a merger," the complaint said.

An order citing the defendant to show cause why it should not be restrained from transferring assets pending trial of the suit against merger, was entered in Snohomish County Superior Court yesterday. It is returnable for hearing December 23.

## Cincinnati Paper Firms Merge

On January 1, 1934 the Albershart Paper Company and the Cincinnati Cordage and Paper Company will merge their personnel, warehouse stocks and mill connections, under the title of the Cincinnati Cordage and Paper Company, with stores at 128 East Sixth street, Cincinnati, Ohio and 535 West Third street, Dayton, Ohio. The companies state that under this arrangement they sincerely feel that they can offer customers a more complete line of dependable papers and give better service than ever before.

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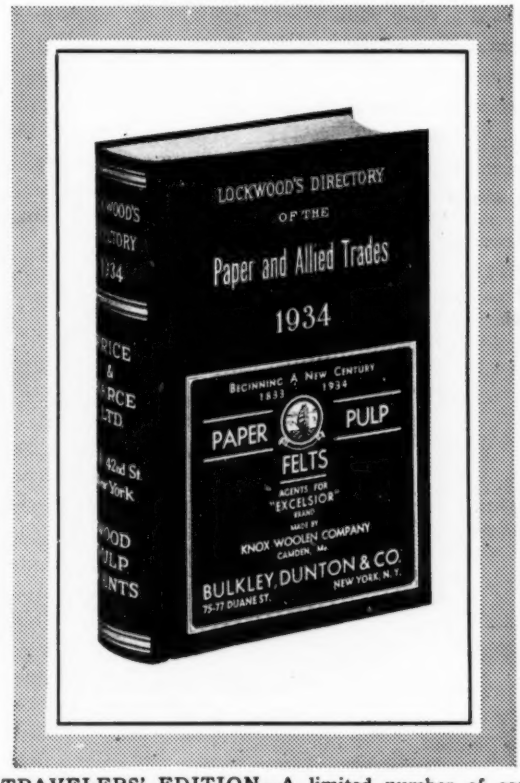


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## COMING EVENTS

AMERICAN PAPER AND PULP ASSOCIATION, Fifty-Seventh Annual Convention and Meeting, Waldorf-Astoria Hotel, New York, February 19-21.

Technical Association of the Pulp and Paper Industry, Convention, Waldorf-Astoria Hotel, New York, February 19-21.

Salesmen's Association of the Paper Industry, Annual Meeting, Waldorf-Astoria Hotel, New York, Tuesday, February 20.

New York Association of Dealers in Paper Mill Supplies, Annual Banquet, Hotel Commodore, Wednesday, February 21.

NATIONAL PAPER TRADE ASSOCIATION OF THE UNITED STATES, Convention, Waldorf-Astoria Hotel, New York, February, 19-21.

Canadian Pulp and Paper Association, Annual Meeting, Montreal, week of January 22.

Technical Section, Canadian Pulp and Paper Association, Annual Meeting, Montreal, January 24-25.

## MERRY CHRISTMAS

The PAPER TRADE JOURNAL wishes its subscribers, its advertisers and its friends everywhere a Merry Christmas and much happiness and increasing prosperity throughout the year just about to open. It is confident that this wish will materialize. These are not empty words. They are backed by statistics. Business is vastly better than a year ago and it gives promise of improving, slowly perhaps, but nevertheless surely. Whether the betterment has been brought about by the remedial measures put into operation by the Roosevelt administration or, as some maintain, by the fact that the cycle of the depression had run its course and that the betterment would have occurred in the natural course of events is immaterial. The revival, so long hoped for, is taking place and that is the important consideration. The paper industry, as was expected, early benefited from the revival and now looks forward pretty confidently to a broadening of business in the course of time into real prosperity. That the expectations of all the paper fraternity along these lines will be fully realized is the sincere wish of the PAPER TRADE JOURNAL at this happy season.

## VOCATIONAL TRAINING SURVEY

Too much can not be said in praise of the wonderful job just completed by the joint efforts of the Federal Board for Vocational Education and the Education Committee of the Technical Association of the Pulp and Paper Industry, which has resulted in the publication by the United States Government of its Bulletin No. 168 on Vocational Training in the Pulp and Paper Industry. This is essentially a survey of job analyses with suggestions on the organization and operation of training programs.

For the paper industry's contribution to this work much credit must go to Harold G. Noyes, coordinator for pulp and paper education in the Wisconsin Vocational School, Appleton, Wis. For the Government Board, the greater part of the work was done by N. B. Giles, special agent under the general direction of Frank Cushman, Chief of the Trade and Industrial Education of the Federal Board for Vocational Education. The whole hearted support given these men by the men of the paper industry reflects the new cooperative point of view prevalent in the industry today. Without the cooperation and friendly criticism of such men the bulletin would not have its very high value.

The bulletin is based upon a detailed study of the question of vocational training in the pulp and paper mills. The analyses was carried on in 23 states and represent the practice throughout the country.

The Bulletin consists of three parts. Part I is intended to give a technically correct but simple description of the different processes of making pulp and paper, together with such basic information as should be in the possession of every worker in the industry.

Part II consists of analyses of all the payroll jobs in the several types of plants, together with brief statements of (1) what the employee should be able to do on each job, (2) what he should know in order to do that work intelligently, (3) what sources of information may be drawn upon for the necessary information, and (4) suggestions as to methods by which training for that job may be carried on.

Part III deals with methods of utilizing the analyses in connection with the organization and operation of a training program. Two principal types of training are recognized as follows: (a) Training on the job under a foreman or experienced man; and (b) trade extension instruction carried on with groups apart from the job in evening or off-shift classes. It is believed that the procedure indicated for setting up a specific training course for any group of employees represents a distinct step in advance of previous publications of the Federal Board which have been intended to offer definite assistance in developing courses of training.

The suggestions and outlines given in Part III should be of particular value to foremen and superintendents of pulp and paper mills who may wish to develop their own programs of plant training, and also to State and local supervisors of industrial education in connection with the

organization of evening trade extension classes for pulp and paper mill workers.

Several pulp and paper companies have definitely realized the importance of training problems and have set up training programs for their personnel. Others have established training programs in cooperation with State departments for vocational education. Many companies, however, have not provided training programs for their personnel. Nevertheless, training on the job continually exists. Although the cost is not identified, it is covered in the cost of production and, perhaps, if it was identified would be in excess of the cost of a well organized and efficient training program.

The past several years of experience with industrial training programs has proved that an efficient program should be built around analyses of the operating jobs of the industry. This fact persuaded the Technical Association of the Pulp and Paper Industry to invite the Federal Board for Vocational Education to cooperate with it in making and publishing such analyses.

The staff of the Federal Board has had wide experience in assisting industries in making such studies. Having been established by an act of Congress to promote vocational education, the Federal Board was glad to cooperate with the Education Committee of TAPPI and make such suggestions as its staff members believe to be workable and practical for the industry.

Copies of Bulletin No. 168 (Trade and Industrial Series No. 49) of the Federal Board for Vocational Education may be obtained for 20 cents per copy from the Superintendent of Documents, Government Printing Office, Washington, D. C. When it is considered that the preparation of the bulletin cost TAPPI and the Federal Board several thousand dollars it is remarkable that the fruits of their work can be obtained at such a low figure.

The Technical Association must be congratulated for again demonstrating its alert and aggressive leadership in the development of the industry. Both the Federal Board and TAPPI are entitled to a real vote of thanks by the many companies that will benefit by their joint efforts.

## Dryden Earnings Down, Outlook Brighter

Earnings from operations of Dryden Paper Company, with mills at Dryden, Ont., dropped to $18,459 in the year ended September 30, 1933, as compared with $56,995 in 1932 and $77,940 in 1931. Income from investments was up to $14,028 from $12,384, providing net earnings of $32,488, which were insufficient to cover bond interest of $88,460 and exchange on U. S. funds of $11,265. As a result the company has a loss of $67,235 as compared with loss of $33,258 in 1932. Sinking fund provision amounted to $15,900 and a new item, write-off on inventory, to $66,550, so that deficit of $149,687 exceeded surplus of $119,492 carried forward from 1932. In the three months ended October 31, 1933, the company had a small profit after bond interest. It is reported that there is some improvement in the consumption of paper and a more hopeful outlook for the sale of kraft paper, the company's principal product. This situation is in contrast to the conditions prevailing in the early part of the last fiscal year.

## J. D. Zellerbach Praises NRA

[FROM OUR REGULAR CORRESPONDENT]

SEATTLE, Wash., December 16, 1933—J. D. Zellerbach, executive vice-president of the Crown Zellerbach Corporation, passing through Seattle on his way to San Francisco from his stay at Washington, sounded two welcome notes of encouragement when discussing conditions in the paper and pulp industry. Mr. Zellerbach, who has worked through all of the past six months with little recess on the paper pulp code, which now has the Presidential signature, expressed himself here as being 100 per cent for the NRA and he is hopeful for the industry's future.

The pulp and paper executive points out that the NRA has forced a resumption of profit-earning, as its recent statement shows and there is much less chance for another slump in business. The law provides that the industry may appeal to the President when foreign competition threatens to undermine American business and close plants. Should Mr. Roosevelt deem the complaint just, he may bring about a tariff protection or establish import quotas. These possibilities represent the best protective measures the industry has yet received.

Future industrial recovery in the Pacific Northwest depends largely, Mr. Zellerbach said, on the continued prosperity of the paper and pulp industry, in that it is complimentary to lumber and supplies varied utility of employment, such as forests, mills, shipping, towing, in addition to the retail and wholesale marketing of paper products.

Crown-Zellerbach Corporation and subsidiaries, operating pulp and paper properties of an estimated value of $52,000,000 along the West Coast area, are reported to date as operating close to normal capacity.

A short time ago, the published financial statement of the Crown-Zellerbach Corporation, for the six-month period ending October 31, 1933, showed a net profit to stockholders of $709,463, as compared with only $35,911 for the same months of the previous year. It is significant to note, that this recovery was made by the management despite demoralization of prices in the news print division of the industry, for which there appears to be no immediate hope.

## News Print Production for November

Production of news print in Canada during November, 1933, amounted to 193,718 tons and shipments to 201,102 tons, according to the News Print Service Bureau. Some of the excess of shipments over production was due to the movement of paper by water prior to the close of navigation. Production in the United States was 87,567 tons and shipments 86,829 tons, making a total United States and Canadian news print production of 281,285 tons and shipments of 287,931 tons. During November, 26,538 tons of news print were made in Newfoundland and 1,421 tons in Mexico, so that the total North American production for the month amounted to 309,244 tons.

The Canadian mills produced 61,903 tons more in the first eleven months of 1933 than in the first eleven months of 1932, which was an increase of 3.5 per cent. The output in the United States was 62,407 tons or 7 per cent less than for the first eleven months of 1932, in Newfoundland 5,296 tons or 2 per cent less, and in Mexico 2,982 tons more, making a total decrease of 2,818 tons or .1 per cent.

Stocks of news print paper at Canadian mills are figured at 30,858 tons at the end of November and at United States mills 19,676 tons making a combined total of 50,534 tons compared with 57,180 tons on October 31, 1933.

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Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

# Pulp and Paper Industry Literature Review

## Abstracts of Articles and Patents Compiled by the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman

**Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.**

### Alkaline Process

**The Chemical Changes in Wood Pulp Caused By Alkalies and Acids.** F. W. Klingstedt. Finnish Paper and Timber J. 15, No. 7: 258-259, 262-264, 266-268, 270; No. 8: 328, 330, 332 (Apr. 25, 30, 1933).—The chemical changes brought about by sodium hydroxide, hydrochloric acid, sulphuric acid, nitric acid and by a few salts of varying concentration in wood pulps, sulphate pulps in special, at room and at low temperatures, were studied. The peptizing effect of the electrolytes was investigated, special emphasis being laid on the dissolving out of the pentosan and in a few cases of the mannan. Caustic soda does not completely remove the pentosans from sulphate pulps as in the case of sulphite pulps, whereas sufficient concentrated nitric acid dissolves the pentosan completely from most of the pulps under investigation. Mannan, however, cannot be removed entirely. Analytical data concerning the determination of mannan in the pulp are given. —C. J. W.

**Steam and Heat-Technological Installations in Ostrand's Sulphite Mill.** G. Edling. Svensk Pappers-Tidn. 36, No. 4: 115-118, 121-126 (Feb. 28, 1933).—A detailed description of the steam plant and heating installation of the sulphate mill at Ostrand, Sweden.—C. J. W.

**Alkali Recovery and Soda Oven Installation.** W. Schmid. Papier-Fabr. 31, No. 16: 245-48 (April 16, 1933).—Description of improvements made in increasing the economic value of soda oven installation. The Nordstrom drying tower is discussed in relation to the heat and alkali recovery and at the same time the problem of the elimination of the obnoxious gases is solved.—J. F. O.

**The Liquor Recovery in the Sulphite Pulp Industry with Reference to the Wagner Oven.** Herbet Kienzl. Papier-Fabr. 30, No. 50: 715-16 (Dec. 11, 1932).—Discussion of the Wagner oven and results in actual practice in mills in various countries. Attempts are being made to use this oven for sulphite liquor recovery.—J. F. O.

**Arrangement for the Evaporation of Black Liquor, Sulphite Liquor or Similar Strongly Foaming Liquids.** Industrikemiska Aktiebolaget, Stockholm, Sweden. Ger. pat. 569,474 (Feb. 20, 1931).—The gas is forced through a screen on top of which is a thin layer of the liquor to be evaporated; in this manner a very intimate contact between the gases and liquid is obtained.—J. F. O.

**Process for the Manufacture of Alkali Sulphite or Bisulphite Solutions from Pulp Waste Liquors Containing Alkali Sulphur Compounds.** Patentaktiebolaget Grondal Ramen, Stockholm. Swed. pat. 75,847 (Dec. 4, 1931).—The organic constituents of the waste liquor are burned and the remaining sulphide and thiosulphate converted into sulphite and sulphate. A part of the residue from the combustion freed from sulphides and thiosulphates, and soluble in water, is treated with sulphur dioxide and calcium carbonate until the alkali salt present in the solution is wholly or for the greater part changed into bisulphite.—J. F. O.

**Process for the Making of Formic Acid and the Recovery of Sodium by the Purification of Waste Liquors Containing Pulp.** Papeteries Navarre, Soc. An. Lyons, France. Swed. pat. 76,052 (Nov. 30, 1929).—Treatment of the waste liquor with an acid exceeding formic acid in strength (or acid salt) and distillation of the mixture, whereby the formic acid is removed during the process and the sodium recovered in the form of sodium salts of the strong acid used.—J. F. O.

**The Question of Making the Evil Smelling Gases from the Alkali Process of Cooking Wood Inoffensive.** Wochbl. Papierfabr, 64, No. 15: 257-58 (April 15, 1933). —The author discusses several methods in use for rendering the gases from the alkali cooking process inoffensive.—J. F. O.

**Scaling Evaporator Tubes.** Société des Condenseurs Delas. Brit. pat. 380,358 (Feb. 23, 1932).—In order to keep the heating surface of the tubes of an evaporator clear of scale, the tubes are arranged in the form of a squirrel cage, and each tube is surrounded by another tube of about twice its diameter. The outside tubes are threaded on loosely, and perforated. As the squirrel cage is rotated the outside tubes roll on the heating tubes and break off the scale that falls into the bottom of the evaporator. —A. P.-C.

# Application of Elementary Statistical Methods In the Testing of Pulp and Paper*

By F. A. Simmonds[1] and R. H. Doughty[2]

**Abstract**

*A demonstration is made of the application of elementary statistical methods to the testing of pulp and paper. The methods if properly applied will furnish valuable information as to the accuracy of test values, the significance of differences, and the comparative merits of operations or results.*

The testing of pulp or paper involves the evaluation of an exceedingly variable material by methods, the precision of which is not always known. It is concerned primarily with average values based, of necessity, on comparatively small samples.

Consideration of such testing data gives rise to several questions, of which the six following are representative: (1) What is the precision of a given set of tests? (2) How many tests must be made to secure any specified approximation to the most probable true average value of the material under test? (3) What is the variability of some property or group of properties of the material being tested. (4) What factors influence this variability, and to what extent? (5) Are observed differences in results significant? (6) How can a large mass of observations be reduced to some convenient and comprehensible form? The task of answering such questions falls within the scope of statistical methods. To apply these methods, it is only necessary to assume that the testing of paper is a process of simple or random sampling from a normal universe *(1)*.

Statistical methods are a branch of mathematics concerned with the study of the average behavior of large groups. The methods are described in the appropriate literature, but access to this is not always easy. It is sometimes desirable to be able to apply some of the simpler methods, or to interpret the results obtained through them, without having to study a number of complex texts. In such cases a brief and at the same time accurate statement of methods and applications would be very useful. The purpose of this article is to supply such an abstract of statistical methods, together with demonstrations applicable to the testing of pulp and paper.

Received September 28, 1933.

* Presented at the fall meeting of the Technical Association of the Pulp and Paper Industry, Appleton, Wis., September 26-28, 1933.

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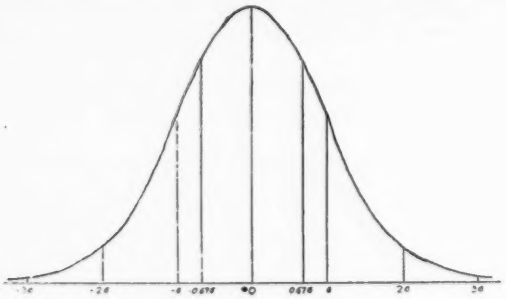

FIG. 1.

| Limits ± | | |
|---|---|---|
| 0.67 | enclose | 50.00% of area |
| 1.00 | | 68.27 |
| 2.00 | | 95.45 |
| 3.00 | | 99.73 |

## Definitions and Outline of Methods

A *universe* in the statistical sense comprises any large general group of related individuals. These individuals make up the *population*. *Simple sampling* is that process of random selection by which a representative portion of the population is withdrawn for analysis. The population may be made up of almost anything. For the insurance actuary it might be the ages at death of the white male population of a given area; for the telephone company statistician, the breaking strengths of cedar poles, or the thicknesses of receiver discs from a production unit. For the paper technician it may be the strength tests on a shipment of pulp, or the averages of tests on each of many sheets of paper, and so forth.

A *normal universe* is one in which the individuals are distributed in accordance with a definite mathematical function, the so-called Gaussian law of error or "law of chance," hereafter referred to as the *normal law*. Numerous other types of universes have been described mathematically, but do not enter the present discussion.

Such a normal universe is represented by the curve of Fig. 1. The origin of the curve, *O*, is the average value of the population, the quantity being measured. It may be noted that the abscissa axis is divided in units of standard deviation $\sigma$, and that the curve is symmetrical in respect to the origin. Geometrically, $\sigma$ measures the point of inflection of the distribution curve.

The area under the curve between any two ordinates represents the relative likelihood, the probability *(11)*, of occurrence of a value in the range between those ordinates. The total area under the curve is equal to unity, or, for every trial some test value is obtained. Fifty per cent of the area is included between the limits of $\pm 0.67\sigma$, so that any value observed at random is as likely to fall within as without that range. The usefulness of these ranges will presently appear.

A universe is specified in detail by a number of mathematical constants or *statistics*. If the statistics of a universe are known, those of a sample of it can be *calculated*. In practice, the statistics of a sample are known, and those of the universe from which it came are *estimated* with a degree of precision depending on the number of values making up the sample. All the inferences which may justifiably be drawn regarding a sample can be expressed by these statistics.

Before proceeding farther, the more important symbols used will be listed, for reference.

$d$ = the deviation (plus or minus) of any test from the average of all tests in a sample.
$\Sigma d^2$ = the sum of the squares of all these deviations.
$m$ = the "maximum error" which for a large sample is $3\sigma$.
$n$ = the number of test values or items making up a sample.
$s$ = in general, the standard deviation calculated for a finite sample, from which the best estimate of $\sigma$ is derived. In this work, $s$ is used specifically for the standard deviation of a small sample.
$\sigma$ = in general, the true standard deviation of a population; in this work also the standard deviation of a large sample.
$\sigma'$ = the standard deviation of an average estimated from $\sigma$ and $n$.
$\sigma''$ = the standard deviation of an average estimated from a sample of similar averages.
$\sigma d$ = the standard deviation of an average difference.
$t$ = a coefficient of $\sigma$.
$V$ = the coefficient of variation.
$\bar{x}$ = the arithmetic mean of all the measured values of the quantity X.
$X$ = any individual value of a variate, or any item in a sample.

The most common statistic is the arithmetic *average* or arithmetic *mean*.

$$\bar{x} = \frac{\Sigma x}{n} \qquad (1)$$

No discussion of this is needed, since everyone is familiar with and has constant use for this statistic. It fails, however, to give full information concerning a sample. Not only the mean, but the distribution of values about the mean, is important.

The distribution of values can be expressed by a number of statistics, of which the primary one is the standard deviation. In the following pages, formulas for calculating these statistics for large samples will first be presented, and then the necessary corrections for samples of small size will be given. The corrections are of much importance for ordinary testing work.

The *standard deviation* is obtained by the equation

$$\sigma = \sqrt{\frac{\Sigma d^2}{n}} \qquad (2)$$

The greater the standard deviation the greater the variability, or dispersion of results with respect to the average.

The *coefficient of variation (4)* is a measure of *relative* dispersion, for use in comparing, for example, two instances in which the same absolute dispersion occurs about two unequal arithmetic means. By its application the relative size of the items in the two samples is accounted for and a significant indication of the comparative dispersion is obtained. The formula is

$$V = \frac{\sigma}{\bar{x}} \times 100 \qquad (1a)$$

The *probable error* is 0.6745 of the standard deviation, or roughly two-thirds of it. Its significance has already been suggested. It is not "the most probable error" but the error on either side of which (smaller or larger) any deviation from the average is *equally likely* to fall. The probable error, like the standard deviation, serves to measure the dispersion of results.

The designation *maximum error* is given by Wright *(10)* to the value, $3\sigma$. The limits $\pm 3\sigma$ from the average will normally include 99.73 per cent of all values measured or obtainable. The designation is reasonable, since less than 0.3 per cent of the values measured should ever fall at a greater distance from the average. The number of single tests which must be made to give an average with a certain expected maximum error from the true average of the material is a useful calculation which will be outlined.

The *standard deviation of an average*, sometimes called the *standard error*, from the true average of the universe sampled can be estimated from the standard deviation of the sample as

$$\sigma' = \frac{\sigma}{\sqrt{n}} \qquad (3)$$

whence

$$n = (\sigma/\sigma')^2 \qquad (4)$$

This assumes that the sample is truly representative.

The *standard deviation* of $\sigma$ may at times be useful. This quantity is $\sigma/\sqrt{2n}$. Its especial application comes in determining whether two standard deviations are significantly different.

Knowing $\sigma$ and $n$ for a sample, $\sigma'$ can be calculated. Or, knowing $\sigma$, the number $n$ of tests required to bring $\sigma'$ to any desired value can be calculated. This is where the concept of maximum error becomes useful.

Suppose that it is desired to know how many tests must be made to obtain an average which shall not (in 99.73 per cent of the cases) differ by more than some quantity $m$ from the true average for the material. First a number of tests are made and $\sigma$ is calculated for them. This value is introduced in equation *4*, using $m/3$ in place of $\sigma'$, and $n$, the necessary number of tests, is calculated.

Fig. 2 shows the way in which $n$ varies with $m$ and $V$.

The averages obtained from a group of samples may be considered as in themselves making up a sample. Their standard deviation $\sigma''$ can be calculated directly by equation 2. For ideal conditions $\sigma''$ should very nearly equal $\sigma'$, when $\sigma'$ is calculated by considering all the items of the several samples as one large sample. If, as is usually the case, $\sigma''$ is much greater than $\sigma'$, it shows that factors other than the variability of the single sample have entered between the samples. This finds its use in the search for sources of error.

Determining the *significance of differences* of average values is an important problem. First, it must be settled what difference shall be "significant." Customary usage, as exemplified in rejecting determinations lying outside thrice the probable error, employs $2\sigma'$ while Wright in his maximum error method takes $3\sigma'$ as the lower limit of significance. In customary usage the limit would be exceeded once in 22 times, in Wright's method once in 370 times, purely by chance. That is to say, once in so many times a difference would be accepted as significant when it was not.

The simplest method, then, is to say that two means differ significantly when the difference between them is greater than $2\sigma'$ or $3\sigma'$ of the one with the larger $\sigma'$.

A more precise method makes use of two sets of $n_1$ and $n_2$ tests, with means $\bar{x}_1$ and $\bar{x}_2$, and standard deviations $\sigma_1$ and $\sigma_2$. Reversing equation 2,

$$\Sigma d_1^2 = \sigma_1^2 n_1; \ \Sigma d_2^2 = \sigma_2^2 n_2.$$

Then, if the two samples are from the same population:

$$a^2 = \frac{\Sigma d_1^2 + \Sigma d_2^2}{n_1 + n_2 - 1} \qquad (5)$$

$$\sigma_d = \sqrt{\frac{a^2}{n_1} + \frac{a^2}{n_2}} \qquad (6)$$

and

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sigma_d} \qquad (7)$$

The probability that the two means differ significantly can be estimated as the value of the probability integral from $-t$ to $+t$. If tables of this integral are not available, $t = 2$ or $t = 3$ can be set as the limits of significant difference, as in the preceding paragraphs; greater values of $t$ would show significant differences.

Again, suppose there are available a series of differences $\bar{x}_1, \bar{x}_2 \ldots$, of paired tests, as for instance the difference in average Mullen tests by two machines on each of $n$ sheets. The values $\bar{x}$ standard deviation, $\sigma$, and standard deviation of the average, $\sigma_d = \sigma/\sqrt{n}$, can be calculated. Then the quotient

$$t = \bar{x}/\sigma_d \qquad (8)$$

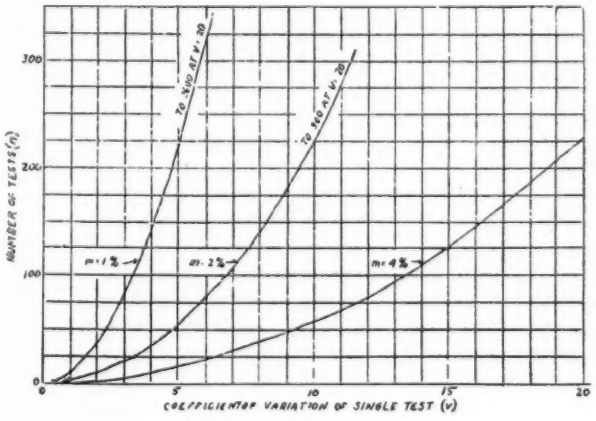


FIG. 2.

is a measure as before of the probability that the differences between the two machines are not due to chance variations. If $t$ is very large, it is probable that the machines are significantly different. Some peculiarities of this method appear later on in this report.

The method of equation 8 is the most sensitive and precise of the three given. For this reason it is advantageous, when at all possible, to design experiments so that it can be applied if a search for significant differences is to be made.

In either case, if $n$ is small the corrections now to be given for sample size must be used. For equations 5, 6, and 7, these are applied to $\sigma_1$ and $\sigma_2$ before calculating back to $\Sigma d_1^2$ and $\Sigma d_2^2$.

The corrections for small samples to be applied to the foregoing constants are given with sufficient accuracy for ordinary work by the curves of Figs. 3 and 4, reproduced from Shewhart *(6)*. Tabular corrections are given by Fisher *(3)*.

A trial value of $\sigma$ is first calculated according to equation 2. This value is denoted as $s$. Fig. 3 then shows the ratio, $r$, of this value to the most probable true value of $\sigma$ of the population from which the sample was drawn for the cases where (I) only the $s$ of a single sample is available, and (II) the average $s$ of many samples is known. That is, $\sigma = s/r$. The ratio is plotted against number of tests $n$ making up the sample, and it can be seen that for $n$ greater than 25 the correction is practically negligible.

Again calculating a trial value $s$ from equation 2, the best values of several statistics of the mean can be obtained by the use of Fig. 4. These curves give the ratio $Z$ of the most probable true values of, respectively, the 99.73

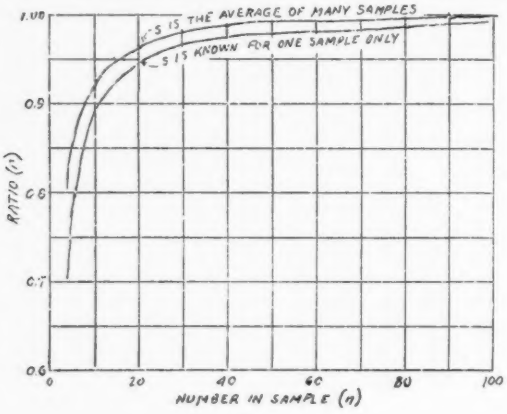


FIG. 3.

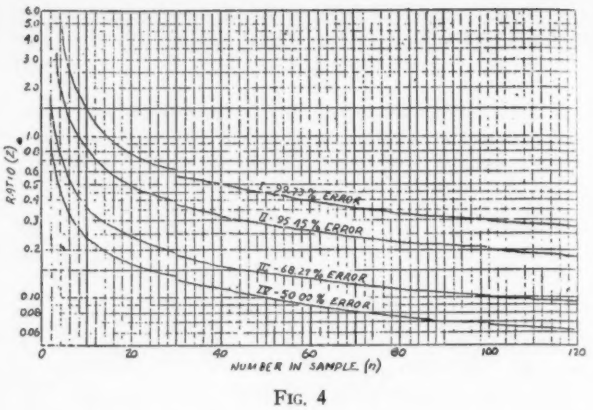


FIG. 4

per cent or maximum error, the 95.45 per cent error, the 68.27 per cent or standard error $\sigma$, and the 50 per cent or probable error of the average, to the standard deviation $s$ of the single tests. These corrections also are practically negligible for $n$ greater than 25. The use of this figure may be better understood by considering equation 3. This equation expresses the relation between the standard deviation of the average and that of the single test (curve III of Fig. 4). For large samples and normal law, from equation 3 $Z = 1/\sqrt{n}$ ($Z$ = ratio of $\sigma'$ to $\sigma$), while from Fig. 4, curve III, $Z$ is seen to be 0.1 for $n$ equals 100. For a small $n$, however, $Z$ increases so that for $n = 9$, $Z$ is equal to 0.365 instead of the 0.333 of normal law. Hence for a sample of 9 tests the most probable true value of $\sigma'$ would be 0.365 $s$ and not $s/\sqrt{n}$ or 0.333 $s$ as obtained from equation 3.

It is especially important to note that for very small samples, the maximum error of the average is not $3\sigma'$, but is several times as great, and that similar variations occur in the other errors.

A little study is necessary to comprehend the details of use of these curves, but they must be employed to avoid a false indication of accuracy in the results of small numbers of tests.

Curves for this same purpose have been developed from Shewhart's curves by Westman (9) who showed their application in the interpretation of certain engineering data.

## APPLICATIONS

The actual use of the foregoing procedures can be made more plain by illustrative examples. Those to be presented are drawn from: (a) a study of the effect of different drying methods on sheet characteristics *(7)*; (b) a study

TABLE I.—STATISTICAL VALUES FOR LOFT-DRIED TEST SHEETS

| Time in pebble mill Min. | Test sheet No. | Bursting strength factor — Single tests — Points per pound per ream, 24x36—500 | | | | Average | Standard deviation of the average for one sheet $\sigma'$ | Probable error of the average for one sheet | Standard deviation of the average of the sheet averages $\sigma''$ | Probable error of the average of the sheet averages | Standard deviation of the direct average of the 32 bursting strength tests $\sigma_1'$ | Probable error of the direct average of the 32 bursting strength tests | Maximum error of the direct average of the 32 bursting strength tests | Ratio $\sigma''/\sigma_1'$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 44 | 2 | 1.10 | 1.16 | 1.19 | 1.22 | 1.24 | 0.038 | 0.026 | 0.037 | 0.022 | 0.016 | 0.011 | 0.048 | 2.31 |
| | | 1.22 | 1.30 | 1.33 | 1.39 | | | | | | | | | |
| | 3 | 1.22 | 1.27 | 1.27 | 1.30 | 1.32 | .025 | .017 | | | | | | |
| | | 1.33 | 1.35 | 1.38 | 1.41 | | | | | | | | | |
| | 4 | 1.24 | 1.27 | 1.30 | 1.38 | 1.36 | .032 | .022 | | | | | | |
| | | 1.41 | 1.41 | 1.41 | 1.41 | | | | | | | | | |
| | 7 | 1.16 | 1.19 | 1.25 | 1.30 | 1.27 | .026 | 0.18 | | | | | | |
| | | 1.30 | 1.30 | 1.35 | 1.38 | | | | | | | | | |
| | | | | | Average | 1.30 | | | | | | | | |
| 66 | 1 | 1.16 | 1.21 | 1.24 | 1.24 | 1.27 | .028 | .019 | 023 | .013 | .011 | .008 | .033 | 2.09 |
| | | 1.32 | 1.32 | 1.32 | 1.35 | | | | | | | | | |
| | 3 | 1.21 | 1.21 | 1.24 | 1.27 | 1.27 | .029 | .020 | | | | | | |
| | | 1.27 | 1.32 | 1.37 | 1.27 | | | | | | | | | |
| | 4 | 1.19 | 1.21 | 1.21 | 1.24 | 1.23 | .021 | .014 | | | | | | |
| | | 1.24 | 1.24 | 1.27 | 1.27 | | | | | | | | | |
| | 5 | 1.21 | 1.24 | 1.27 | 1.27 | 1.30 | .028 | .019 | | | | | | |
| | | 1.32 | 1.35 | 1.35 | 1.42 | | | | | | | | | |
| | | | | | Average | 1.27 | | | | | | | | |

of the effect of calendering on sheet properties *(8)*; and (c) a comparison of several test sheet machines *(2)*.

### A Study of Drying Methods

An analysis of the bursting strength test values for sheets of a sulphite pulp milled for 44 and for 66 minutes under the Forest Products Laboratory pebble mill procedure and loft-dried between blotters, is presented in Table I. The correction factors of Shewhart were used in the calculations.

Inspection of these data reveals several interesting facts. The probable errors of both averages used are higher for the 44-minute than for the 66-minute milled stuff. This indicates that the 66-minute sheets are more uniform. Since all factors were held as constant as possible, and since the formation of the sheet is least amenable to control, it may be said that the 66-minute sheets have a better formation than the others, 1.37 being the ratio of 0.011 to 0.008, the probable errors of the direct averages of the 32 bursting tests. The probable errors for the four sheets of each stuff fluctuate somewhat, the sheets not being equally uniform.

When the four sheet averages for each stuff are averaged, and their probable errors determined, it is seen that the one for the 44-minute sheets is 1.6 times as great as that for the 66-minute sheets. While the average test on any 66-minute sheet might be expected never to vary from the true average for the material (many sheets) by more than $\pm 0.033$ about 2.5 per cent on a test of 1.26) that for the 44-minute sheets might vary by $\pm 0.048$. The 66-minute sheets are not only more uniform but more readily duplicated.

Data of the same nature were obtained for five representative stuffs, sheets of each of which were dried in a loft, in a vacuum drier, and in an electrically heated drier at 65° C. They are given in Table II.

When the squares of the probable errors of the direct averages of the bursting strengths of each of the several stuffs dried in the three ways are added and the respective square roots extracted the values following are obtained: Electric oven $\pm 0.0265$; vacuum oven $\pm 0.0280$; loft $\pm 0.0284$. Hence, the precision of the data from the sheets dried in the two ovens is slightly better than that from those dried in the loft. In certain instances of an individual stuff, the precision of the results obtained through the use of the electric oven is less than that obtained using one of the other two methods. Since, however, the general trend of precision of the results is slightly in favor of the electric oven, these apparent exceptions are interpreted to indicate the effect of formation differences associated with other unknown factors, among which are probably inherent fiber properties.

TABLE III
STATISTICAL VALUES FOR FOLDING TESTS ON KRAFT PAPERS

| Machine run No. | Basis weight 24x36 —500 pounds | Degree of calendering, qualitative | Machine direction of folded strip | Mean folding endurance, number double folds | Standard deviation of single test | Probable error of mean | Coefficient of variation |
|---|---|---|---|---|---|---|---|
| 12 | 62 | None | In | 1426 | 1110 | 236 | 78 |
| 12 | 62 | None | Across | 224 | 153 | 33 | 68 |
| 12 | 62 | Low | In | 922 | 570 | 121 | 62 |
| 12 | 62 | Low | Across | 225 | 138 | 29 | 61 |
| 12 | 62 | Medium | In | 1007 | 620 | 131 | 62 |
| 12 | 62 | Medium | Across | 267 | 172 | 36 | 65 |
| 12 | 62 | High | In | 875 | 530 | 113 | 60 |
| 12 | 62 | High | Across | 232 | 142 | 30 | 61 |
| 13 | 48 | None | In | 838 | 487 | 103 | 58 |
| 13 | 48 | None | Across | 104 | 67 | 14 | 65 |
| 13 | 48 | Low | In | 1006 | 604 | 128 | 60 |
| 13 | 48 | Low | Across | 83 | 51 | 11 | 62 |
| 13 | 48 | Medium | In | 1149 | 770 | 163 | 67 |
| 13 | 48 | Medium | Across | 73 | 43 | 9 | 59 |
| 13 | 48 | High | In | 534 | 360 | 75 | 68 |
| 13 | 48 | High | Across | 74 | 45 | 10 | 61 |
| 15 | 30 | None | In | 158 | 100 | 22 | 63 |
| 15 | 30 | None | Across | 12 | 9 | 2 | 75 |
| 15 | 30 | Low | In | 124 | 86 | 18 | 69 |
| 15 | 30 | Low | Across | 12 | 8 | 2 | 67 |
| 15 | 30 | Medium | In | 199 | 135 | 31 | 68 |
| 15 | 30 | Medium | Across | 18 | 13 | 3 | 72 |
| 14 | 23 | None | In | 393 | 260 | 56 | 66 |
| 14 | 23 | None | Across | 39 | 24 | 5 | 62 |
| 14 | 23 | Low | In | 669 | 390 | 84 | 58 |
| 14 | 23 | Low | Across | 37 | 24 | 5 | 65 |
| 14 | 23 | Medium | In | 750 | 475 | 101 | 63 |
| 14 | 23 | Medium | Across | 32 | 21 | 5 | 66 |
| 14 | 23 | High | In | 324 | 205 | 43 | 63 |
| 14 | 23 | High | Across | 31 | 21 | 5 | 68 |

The ratios of the standard deviation of the average of the sheet averages to that of the direct average of the 32 bursting strength values are an indication of the variability of the sheets among themselves. The general trend is for the variability to be least in the case of the sheets dried in the electric oven.

Thus the elementary statistical methods afforded means by which to compare the efficiency of three methods of drying test sheets and also suggestions as to the source of certain other factors influencing the variability of results.

### The Significance of Folding Endurance Tests in a Calendering Study

The results of folding endurance tests made on several tamarack kraft papers differing, as indicated, in ream weight and in degree of calendering, are recorded in Table III. The statistics useful in conjunction with these data are also given. Each average for the folding endurance is the result of ten tests. The coefficients of variation of these values were calculated in order to have a common basis upon which to judge the effects of ream weight, machine direction of the test strip, and the degree of calendering. An inspection of these coefficients shows that they vary over a relatively small range without any regular trend. Thus the conclusion is suggested that, for this particular series at least, the variability of the folding test is not influenced either by the ream weight or the degree of calendering of the paper or by the machine direction of the

TABLE II.—STATISTICAL VALUES FOR SHEETS FROM FIVE STUFFS DRIED IN THREE WAYS

| Stuff | Drying method | Standard deviation of the average of the sheet averages $\sigma''$ | Probable error of the average of the sheet averages | Standard deviation of the direct average of the 32 bursting strength tests $\sigma_1'$ | Probable error of the direct average of the 32 bursting strength tests | Maximum error of the direct average of the 32 bursting strength tests | Ratio $\sigma''/\sigma_1'$ |
|---|---|---|---|---|---|---|---|
| 22-minute soda | Electric oven | 0.006 | 0.003 | 0.004 | 0.003 | 0.014 | 1.50 |
| | Vacuum oven | .008 | .004 | .004 | .003 | .012 | 2.00 |
| | Loft | .010 | .006 | .008 | .006 | .025 | 1.25 |
| 44-minute sulphite | Electric oven | .031 | .018 | .011 | .008 | .033 | 2.82 |
| | Vacuum oven | .018 | .011 | .016 | .010 | .041 | 1.12 |
| | Loft | .037 | .022 | .016 | .011 | .048 | 2.31 |
| 66-minute sulphite | Electric oven | .018 | .011 | .012 | .008 | .036 | 1.50 |
| | Vacuum oven | .027 | .016 | .012 | .007 | .037 | 2.25 |
| | Loft | .023 | .013 | .011 | .008 | .033 | 2.09 |
| 66-minute sulphate | Electric oven | .006 | .003 | .015 | .010 | .046 | .40 |
| | Vacuum oven | .017 | .010 | .014 | .010 | .042 | 1.21 |
| | Loft | .024 | .014 | .014 | .010 | .042 | 1.71 |
| 110-minute sulphate | Electric oven | .027 | .016 | .014 | .010 | .042 | 1.93 |
| | Vacuum oven | .025 | .014 | .013 | .009 | .038 | 1.93 |
| | Loft | .027 | .016 | .013 | .009 | .040 | 2.10 |

test strip. In consideration of the relatively minute volume of the sample tested in a single determination of the folding endurance of a paper, it appears likely that the factor of greatest influence on the variability of such results is the formation of the sheet.

The values of probable error of the mean given in Table III permit certain conclusions as to the significance of the variations observed in the several runs. Such a comparison also shows just what the different measures of concordancy mean. Approximately, thrice the probable error equals twice the standard deviation. Using this limit, it can be seen that possibly significant differences occurred between only the medium and high calenderings of runs 13, 14, and 15, and the zero and low calenderings of run 14. Using the probable error itself as the limit nearly all the variations are classed as significant, in that they may be exceeded by chance not more than half the time. The application of equations 5, 6 and 7 is also possible. Taking as an example the data of machine run 12, no calendering and low calendering, machine direction:

$$X_1 = 1426 \qquad X_2 = 922$$
$$\sigma_1 = 1110 \qquad \sigma_2 = 570$$
$$n_1 = n_2 = 10$$

From this

$$\Sigma d_1^2 = 12{,}321{,}000 \qquad \Sigma d_2^2 = 3{,}249{,}000$$

$$a^2 = \frac{12{,}321{,}000 + 3{,}249{,}000}{19} = 820{,}000$$

$$\sigma_d = \sqrt{\frac{820{,}000}{10} + \frac{820{,}000}{10}} = 405$$

$$t = \frac{1{,}426 - 922}{405} = 1.25$$

The corresponding probability is 0.79 or there are 21 chances in 100 that the difference is due to chance alone, that is, to normal errors of sampling from one universe, and not to a significant effect of calendering.

The fact that three of the four runs pass through a maximum at medium calendering is, however, also significant, and adds considerable weight to the differences observed. There is but one chance in 64 (i. e. $4^3$) that any particular degree of calendering of the 4 would give the highest strength in each of 3 consecutive trials.

As an illustration of the use of the formula for determining the number of tests required to produce an average, the maximum error of which will fall within a predetermined limit, the results of the folding test on the sample from machine run 13, of low calendering and cut in the machine direction, can be used. It is desired to obtain an average value for the folding strength of this sample of such a degree of accuracy that 99.73 per cent of all such averages would not differ from the true average of the material sampled by more than ±30 folds. Substituting in the formula:

$$n = \frac{(604)^2}{10} = 3{,}648 \text{ tests.}$$

It is apparent then that with such variable material this degree of precision in the mean is not practicable to obtain because of the enormous number of tests required to secure such precision.

### A Study of Test Sheet Production

The data of Table IV were procured in the course of a comparative survey of commercial sheetmaking machines. These data are based on sixteen bursting strength tests per sheet made on sets of twenty sheets each. All sheets were made on the same machine; each set was couched in a different way, and was pressed as two subsets of ten each. Otherwise, all conditions were as nearly as possible constant throughout. It was desired to know which couching procedure gave the most uniform and duplicable results. In order to determine this, the various calculations shown in the table were made.

The value for coefficient of variation given in the fifth column of Table IV shows relatively little difference in the uniformity of the sheets couched by different methods. Taking the sets of sheet averages as samples gave column 6, where the best showing is made by the 5-pound per square inches flat pressure, the heavy roll with couch plate being next best. The ratios of column 8 are likewise the smallest for these two conditions.

Thus far, the analysis has shown that the methods of couching used make relatively little difference in the uniformity of individual sheets. The duplicability of sheets is best when couched by procedures 2 or 5. If the only factors in lack of duplicability were those causing lack of uniformity, the ratios of column 8 should fluctuate about 1, whereas they are all considerably greater.

The effect of differences in pressing is analyzed in columns 9, 10 and 11. The difference in strength of subsets (duplicate pressings) is recorded in column 9, the calculated standard deviation of this difference (equation 6) in column 10. These values give the ratios $t$ (equation 7) from which the results given in column 11 are derived. In two cases the ratios are large enough to warrant the statement that press operation was not exactly duplicated. That is to say, the difference in the paired pressings was greater than might have been expected from the variability of the average strengths of the several sheets.

The method of differences may also be applied with some justification. The values of column 9 then become a sample of 6, with $x=0.0015$, $s=0.0050$, and $\sigma_d$ (using the ratio factor of curve III, Fig. 4) is 0.0026; whence $t = 0.0015/0.0026 = 0.58$, and taken as a whole these differences are not significant.

It may be well before concluding the discussion to in-

TABLE IV.—ANALYSIS OF THE EFFECTS OF SHEETMAKING VARIABLES

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Coefficient of variation of the average | | | | | |
| Set | Subset | Couching mechanism | Average bursting strength pts./lb./ream | Average coefficient of variation of the single test V' per cent | Observed V'' per cent | Calculated V' per cent | Ratio V''/V' | Difference between subsets A and B | Standard deviation of the difference $\sigma_d$ | Probability that difference (9) may be due to assignable causes associated with press operation rather than simply to the lack of duplicability of the sheets |
| 1 | A | Heavy couch roll ..... | 0.356 | 5.18 | 1.52 | 1.30 | 1.17 | +0.008 | 0.0029 | 0.992 |
| | B | | .348 | 4.97 | 2.08 | 1.24 | 1.67 | | | |
| 2 | A | Heavy couch roll and couch plate | .348 | 5.30 | 1.45 | 1.33 | 1.08 | + .002 | .0027 | .52 |
| | B | | .346 | 4.85 | 1.93 | 1.21 | 1.60 | | | |
| 3 | A | Very light couch roll ..... | .363 | 5.23 | 1.93 | 1.31 | 1.47 | + .002 | .0006 | .47 |
| | B | | .361 | 4.91 | 1.84 | 1.23 | 1.49 | | | |
| 4 | A | Very light couch roll with plate.. | .347 | 4.71 | 2.86 | 1.18 | 2.42 | ± .0 | .0048 | .0 |
| | B | | .347 | 4.51 | 3.22 | 1.13 | 2.85 | | | |
| 5 | A | Flat plate pressure 5 lbs./sq. in. | .363 | 4.73 | 1.34 | 1.18 | 1.13 | — .008 | .0026 | .998 |
| | B | | .371 | 4.43 | 1.73 | 1.11 | 1.56 | | | |
| 6 | A | Flat plate pressure 20 lbs./sq. in. | .379 | 4.20 | 2.32 | 1.05 | 2.20 | + .005 | .0048 | .70 |
| | B | | .374 | 4.60 | 2.17 | 1.15 | 1.88 | | | |

quire, "Not significant of what?" The values of x, $\sigma_d$, and $t$ just given were calculated using the differences with their algebraic signs as obtained by subtracting subset B from subset A in every case. Then what has been determined is that there is no significant tendency for the average of set A to be larger than the average of set B. This is not exactly what it is desired to know. By neglecting the signs of the differences, considerable change is brought about. Now $x = 0.0041$, $\sigma_d = 0.00163$, $t = 2.52$, which evaluated exactly says that a difference as large as the average difference observed would occur by chance only somewhat more than once per hundred trials; hence press operation was not exactly duplicated.

The preceding paragraph emphasizes the statement that common sense must be used in applying the methods. A mere mechanical duplication of calculations is not enough to ensure correct results. Two things especially may cause trouble if not properly understood. The "maximum error" is not the greatest possible error; it is the error which will be exceeded in not over 0.27 per cent of all cases. Criteria of significant differences, such as the maximum error, $3\sigma$, twice the standard deviation, $2\sigma$, a value of $t$ (equations 7 and 8) of 3 or more, or of 2 or more, may be selected, but they must be reported in order that the proper interpretation may be placed on "significant."

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## Howard Coonley Again Heads A. S. A.

The re-election of Howard Coonley to the presidency of the American Standards Association for the year 1934 was announced at the annual meeting of the Association at the Hotel Astor Wednesday of last week. Mr. Coonley is the president of the Walworth Company, New York, and also a director of several industrial, insurance, and banking organizations. F. E. Moskovice, chairman of the Board of the Marmon Herrington Company of Indianapolis, and vice-president of the American Standards Association, was also re-elected for the coming year.

J. C. Irwin, representing the American Railway Association, and F. M. Farmer, representing the American Society for Testing Materials, were elected to the chairmanship and vice-chairmanship, respectively, of the Standards Council of the American Standards Association, the body in charge of the development of technical standards.

## News Print Industry Working Its Way Out

MONTREAL, Que., December 18, 1933—With the month of November showing another substantial increase in the production of news print here, the feeling is growing that the industry is gradually working its way out of the difficulties which have surrounded it during the past few years. With a total output of 193,718 tons for November, an increase of slightly over 20 per cent over the output for November, 1932, production for the eleven months ended with November is up by 62,992 tons as compared with the corresponding eleven months of 1932.

## TAPPI Member Publishes Book on Patents

The Preparation and Prosecution of Patent Applications is the title of a 484 page book just published by the Michie Company of Charlottesville, Va., and written by Charles W. Rivise, patent attorney and chairman of the Patents Committee of the Technical Association of the Pulp and Paper Industry. Copies are obtainable from TAPPI, Book Department, 370 Lexington Avenue, for seven dollars per copy.

That there is a fertile field for books on this subject is well known to every inventor, research director and patent attorney, for the ignorance of patent procedure characteristic of the average technician is not a question for debate but a simple statement of fact. The consequence of this lack of knowledge is that inventors are unable to give to their patent attorneys the sort of help that even the best-informed and most sagacious solicitor must have in order properly to protect his client's invention.

With the publication of this book the inventor at last has a complete and authoritative work to guide him. Written in the lucid and entertaining style well known to readers of Mr. Rivise's frequent articles in the PAPER TRADE JOURNAL and other trade and technical magazines, it is a most fascinating volume. Even if it served no other function, its comprehensive survey of modern industrial practice as set forth in the hundreds of case references used in explanation of the various legal principles would make it a worthwhile contribution to contemporary technical literature, since no reader can fail to have his horizon tremendously broadened by even the most casual inspection of the book.

In it are described the prerequisites of patentability and validity and the factors which determine the scope of a patent. It details the steps preliminary to the filing of an application and gives rules for analyzing an invention and ascertaining its true scope. This background is, of course, absolutely necessary for the proper preparation and prosecution of a patent application.

Two full chapters (83 pages) are devoted to the claims. Of particular interest to the technical man is the fact that much attention is devoted to chemical claims. The very difficult subject of chemical claims thus receives adequate treatment and becomes for the first time intelligible to the layman.

Detailed steps in the prosecution of the application to the final issuance of the patent are given and include the various methods of overcoming the examiner's grounds of rejection. Appelate procedure within and without the Patent Office is covered. Correction of patents after issuance forms a part of the subject matter.

Interference procedure properly finds no place in this book. This branch of patent law is so highly technical and complex that Mr. Rivise foresaw the necessity of separate treatment and in 1932 published his book "Interference Practice." (The Michie Co.) It is particularly fortunate that the format of the two volumes is identical, the same accessibility to the material being in each case assured by the complete and carefully prepared index. Both books should find a place in the library of every inventor and attorney.

## Whiting-Plover Co. Moves New York Office

The Whiting-Plover Paper Company, Stevens Point, Wis., announces the removal of its New York office to 501 Fifth avenue, New York City. The Room Number is 2010, and the telephone number remains the same—Vanderbilt 3-5198. Louis Gailer is resident manager.

# A Comparison of Sheet Machines for Pulp Evaluation*

By R. H. Doughty[1] and C. E. Curran[2]

**Abstract**

*A comparison of five different machines for making pulp test sheets (a machine comprising the apparatus for forming and couching the sheet and not including the accessory presses, special driers, etc.), where sheets were made from a wide range of pulps and stuffs and tested for burst and tear, gave the following results:*

*1. The center areas of the test sheets were of about equal uniformity, regardless of the machine used. Considering the entire sheet area, however, small round sheets were found to be most uniform.*

*2. Sheets made on the machine designated as No. 5-A were most readily duplicable. This machine was slower in operation than any of the others. However, since less sheets were required than with the other machines to produce an equally reliable average value, this machine gave the greatest economy in total testing time.*

*3. The tests of reproducibility of results by several operators were inconclusive.*

*4. The actual differences between machines, either in true average values, reproducibility of results, or duplicability of test sheets, are remarkably small, much more significance attaching apparently to the procedures of pressing and drying the sheets, or to other operations subsequent to formation, than to the operation of sheet making per se.*

How best to evaluate a pulp for its papermaking properties is a very urgent question at the present time. An ideal procedure for pulp evaluation should be independent of any method of sheet making, and should permit testing of the pulp in suspension or similar wet form. So far, however, empirical attempts in this direction have not been successful, and until they are, reliance must be placed on the test sheet method of evaluation.

When the idea of applying paper testing methods to pulp first appeared, at about the start of this century, sheets dipped on a hand mold were used, and test sheets are still termed "hand-sheets" with disconcerting frequency. Later *(5)* the inherent difficulties of using the hand mold were realized. Wilén in 1920 *(13)* developed a sheet making machine; at about the same time the Bureau of Standards produced one *(10)* and Bachelder *(2)* showed conclusively the superiority of the mechanical means of producing sheets. Despite the statement in a recent publication *(8)* that the hand mold is a more controllable and suitable instrument than a sheet making machine, the general opinion is that any means of producing test sheets must be mechanized in so far as possible in order to avoid personal errors.

Granted that a sheet machine is desirable, there is still considerable difference of opinion as to what form it should take, and how it should be operated. The Technical Section of the British Association applied itself to this problem early in 1928, and some 20 months later issued a report *(9)* describing the progress made. This report offered what was without doubt the most carefully designed and thoroughly tested apparatus and method yet known for producing sheets. In designing this machine and method two considerations had apparently been uppermost; namely to select conditions (1) where the effects of slight manipulative differences or errors would be at a minimum, and (2) which would produce sheets, the properties of which were as nearly as possible identical with those produced in actual paper machine operation. The machine and method were developed primarily for use with mechanical and unbeaten chemical pulps.

This British machine and method have been adopted as primary standards (or their adoption considered) in various countries. The Canadian Forest Products Laboratories in a detailed comparison of the British machine with other machines *(1)* show the British machine to have a small but apparently definite margin of superiority. The question is, however, a complicated and somewhat vexing one. The pulp testing committee of TAPPI has accordingly sponsored a series of tests to aid them in arriving at definite recommendations. These studies are being carried out at the U. S. Forest Products Laboratory. The results now available are reported herewith.

## Analysis of the Problem

A consideration of the literature *(4)*, *(7)*, *(9)*, shows general confusion existing as to the details of proper sheet making methods. Any attempt to study such methods must be preceded by a clear understanding of the points to be tested and the possible variables to be encountered and controlled.

The sheet making operation in all its parts includes: (1) Preparing a uniform suspension of fibers in water; (2) procuring a representative sample of this suspension; (3) forming a uniform sheet from this sample; (4) couching the formed sheet; (5) pressing the couched sheet; (6) drying the pressed sheet.

By far the greatest amount of difficulty arises in connection with the last four items. Each of the six items includes a piece of equipment made up of several parts together with as many manipulations. Changes in any or all of these minor units may have, and frequently are known to have, a large influence on the results. These changes may influence either the actual properties of the sheet (make the test higher or lower) or the uniformity of the sheet, or the duplicability of sheets made at one time by one operator, or the reproducibility of sheets at different times by one operator, or by different operators; or they may influence all four. It is possible, and can be shown, that the method (apparatus and manipulations) giving the highest test results does not always give the most uniform ones; this will be seen, for example, in the tests reported on the effects of couching procedure. It is also possible, and can be demonstrated, that the collection of unit parts and operations giving best results with one material will not give the best results with all. This lack of general adaptability will make it necessary eventually

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to specify distinct procedures for several broad general classes of materials or products.

An additional factor in machine quality besides actual test value, uniformity, duplicability and reproducibility of sheets, and general adaptability, is that of ease and speed of operation. This is especially important in a machine for control work, as contrasted to one for research or reference standard purposes where speed might be a minor factor. Of course, if the lessened speed resulted in such increased accuracy that a smaller number of tests could safely be used, the slower sheet forming method might actually require the least total labor in a complete testing operation and, therefore, be preferable.

For any testing method to have maximum worth, not only must the test results produced by it be in reasonable self agreement, but the relation of its results to those of some standard must be known. Two methods may give equally uniform results that differ in actual magnitude, or the reverse. This all leads to the conclusion that perhaps conditions, rather than equipment, are the important things to specify.

### Plan of Work

The work reported here was originally designed as a comparison of, primarily, the sheetmaking machines themselves. For this reason, all variables aside from those of forming and couching the sheet were fixed as definitely as possible.

Five sheet machines, described later, were available. Two of these produce round sheets, two square sheets, and one a rectangular sheet. After considering various angles of the problem as just outlined, the following method of attack was selected:

In view of certain conflicting claims as to the superiority of sheets formed in round or square shapes, the first step was a comparison of the two types of sheets in the hope that one or the other might be definitely eliminated and the problem thus simplified. Some significance was found to attach to this differentiation, but the differences were not large enough to definitely eliminate either type. A detailed comparison of all the machines was therefore undertaken by four operators, using several pulps and stuffs. The materials were selected to cover as wide a range as possible in fiber properties. Certain discrepancies appeared in this work which it seemed could be explained on the basis of differences in couching and pressing procedure, and a study of this point was therefore made.

The performance of the machines was judged by means of the uniformity, duplicability and reproducibility of sheets, and adaptability and speed of operation. Rough measures of uniformity and duplicability were obtained by observing the visual perfection of the sheets. For precise comparison, the bursting strengths, tearing strengths, and thicknesses of the sheets were measured. Speed and ease of operation were also observed.

The major part of the performance criteria is based on the analysis, by statistical methods, of the Ashcroft bursting strength data for the sheets. For the details of this procedure reference is made to a paper *(11)* presented to the Technical Association at their 1933 fall meeting, which includes a general discussion of statistical methods and related matter, together with a complete analysis of one of the sets of data from the present report. In the present report it is sufficient to say that the analysis leads to a set of values termed "standard deviations." The standard deviation is a measure of the variability (or inversely, of the uniformity) of data. If the standard deviation is small, the uniformity is high, and vice versa.

The standard deviation of the single test is used to express the uniformity of an individual sheet. Taking the group of averages on a set of sheets as a sample, the standard deviation of the sheet average can be obtained. This is taken as a measure of the duplicability of sheets by one operator. Because but four operators were involved in this study the reproducibility by several operators can be determined only by means of the range between values.

A certain amount of judgment must be used in interpreting the values given. Some may question the method of averaging standard deviations, but the data do not seem to justify more complicated methods. For the present the use of the values given must be restricted to a generalized comparison of the machines.

### Equipment

Through the cooperation of TAPPI, the Institute of Paper Chemistry, and equipment manufacturers, five machines were made available for test. These were the British standard, the Swedish or Sandberg, Valley, and Williams commercial units, and the machine built and used for research work at the Forest Products Laboratory. It was planned to include the Bureau of Standards (Aminco) machine but unfortunately this was not available.

Several of the leading characteristics of the machines are recorded in Table I. From this it can be seen how they differ in details of construction. Table I also serves to suggest the number of mechanical variables involved in test sheet production.

At the request of the Executive Committee of TAPPI the identity of the machines in this preliminary report has not been disclosed, code numbers being used. In certain parts of this report, the identity of some of the machines is obvious but, unfortunately, this cannot be entirely avoided.

### Materials

PULPS

The experimental materials used comprised a number

TABLE I.—CHARACTERISTICS OF SHEET MACHINES

| Machine | Sheet dimensions, inches | Wire mesh: For chemical pulp | Wire mesh: For mechanical pulp | Wire support | Deckle box height, inches | Water leg below wire, inches | Size of discharge pipe, inches | Stock agitator | Approximate drainage time with water only, seconds | Couching apparatus |
|---|---|---|---|---|---|---|---|---|---|---|
| Swedish | 8.5 diameter | 80 | 100 | None | 17 | 39.4 | 2.00 | Perforated mechanical plunger | 6 | Brass plate 1 cm. thick. |
| British | 6.25 diameter | 80 | 100 | Drilled and grooved plate and 20-mesh backing wire | 16.25 | 31.5 | 1.25 | Perforated hand plunger | 4 | 13 kg. roll and thin brass couch plate. |
| Williams | 8x8 | 60x80 | 60x80 | Cast square-lattice [1] plate, 14-mesh backing wire | 5.75 | 41 | 2.00 | None [4] | 2 | Light [3] wooden roll. |
| Valley | 8.5x8.5 | 40x60 | 40x60 | Cast square-lattice [2] plate, 14-mesh backing wire | 8.25 | 41 | 1.25 | Perforated hand plunger | 4 | 30-pound [3] roll. |
| F. P. L. | 7x9 | 100 | 100 | Drilled and countersunk plate, 14-mesh backing wire | 15.75 | 40 | 1.50 | Perforated hand plunger | 6 | Light wooden roll. |

[1] Top edges of lattice bars machined sharp.
[2] Top edges of lattice bars machined flat.
[3] The press method of couching is recommended by the manufacturers as an alternate.
[4] The manufacturer advises that a perforated hand plunger is a part of the standard equipment with this machine, but was inadvertently omitted from the instrument furnished for this work.

TABLE II
PULPS AND STUFFS USED

| Key | Description | Slowness Schopper-Riegler beating degree |
|---|---|---|
| 1 | Unbleached sulphite, unbeaten | 17 |
| 2 | Unbleached sulphite, well beaten | 66 |
| 3 | Unbleached sulphite, highly beaten | 82 |
| 4 | Unbleached sulphite, highly beaten | 75 |
| 5 | Unbleached sulphite, partially beaten | 28 |
| 6 | Strong sulphate, unbeaten | 15 |
| 7 | Bleached sulphite, unbeaten | 17 |
| 8 | Mechanical pulp | 57 |
| 9 | Rag pulp, partially beaten | 35 |
| 10 | Unbleached sulphite, highly beaten | 85 |

of representative pulps and stuffs. These are listed in Table II, together with the key numbers by which reference is later made to them. All were of commercial origin.

BLOTTERS

As noted later, the sheets were couched on blotters. The blotters were those used in research work, and recently adopted for routine control at the Forest Products Laboratory. They are a chemically pure, lintless, white photographic blotter of 120 pounds basis (24 x 36—500) weight, having an absorbency by the Klemm test of .55 mm., and a thickness of 0.025 in. They are thus much more bulky than those recommended for the British machine *(9)*. Absorbency of the blotters, according to the British work, influences the absolute magnitude of the test value. There is, however, no suggestion that it influences the precision of the tests, which is the point of interest in this study.

### Procedure

It has already been stated that the work here reported was done to afford, as nearly as possible, a comparison of sheet forming (sheet machine operation) alone.

Sufficient of each stuff to make all the sheets required was diluted so that 500 cc. would contain the proper amount of fiber for one sheet on the machine making the largest sheet. After the largest sheets were made, the stock was diluted again for the next smaller sheets, and so on. The stock was kept well stirred and little trouble was experienced in remaining within 2 per cent of the ream weight (100 grams per square meter, or 61.6 pounds 24 x 36 and 500 count) selected.

Sheets were formed on the machines, with some exceptions later given, just as directed by the manufacturer. The sheets were couched, using the general procedure recommended by the manufacturer, but employing blotters in every case as a couching medium. The sheets were then pressed between blotters on an hydraulic press in sets of 10. A pressure of 50 pounds per square inch was employed throughout. After pressing, the sheets were air-dried between the blotters, separated from them, conditioned and tested in the usual way.

In addition to the procedure described, a set of sheets was made using the machine No. 5 and the procedure prescribed by the manufacturer for use with this machine. This is reported as machine No. 5-A.

With the three highly beaten sulphites, which were the slowest stuffs, the dilution recommended by the manufacturers was found impracticable. The volume of stock in the deckle box was therefore decreased for these three stuffs until the sheet could be formed in 15 to 30 seconds.

The foregoing paragraphs give the general details of operation. Certain other details pertaining only to special sets of tests are recorded in connection with the discussion of these tests.

## RESULTS

### Comparison of Sheet Form

Two schools of thought exist in regard to machine form, neither apparently having backed its judgment with published data. Sheets made on a round machine may be of poor formation because of swirling. Sheets made on a square machine may be non-uniform because of drying stresses. Some simply seem to prefer one or the other form as a matter of sentiment. It may be noted that one machine, producing round sheets, has a special device below the wire to eliminate swirling and distribute the suction evenly.

Sheets made on large and small diameter round machines, and a rectangular machine were therefore compared. In order to see if the difficulty lay in the machine form or in drying, 5-inch squares were cut from rectangular and large round sheets before pressing, and treated as separate sheets. The sheets were tested by the Ashcroft tester, making one burst in each square inch of the sheet, and recording in such a way that each test could be accurately located on the sheet. The three machines used are quite similar in general operating principles.

The results of this work are recorded in table III. In two cases out of three, the small round sheets were most uniform (lowest standard deviation of the single test) and in three cases out of five the square sheets were more uniform than the comparable large round or rectangular ones. In duplicability (standard deviation of the average) for unbeaten pulps the small sheets were better, on the whole, than the large ones and plates gave better results than blotters. With beaten stuffs, the advantage of the small square sheets disappeared, and blotters gave better results than plates.

The column headed "ratio of low tests" requires explanation. If the sheets were for any reason weaker or less uniform on the edges, more low tests would be expected there. A test less than the value of average minus standard deviation was taken as "low." Then from the tabulated data, the number of low tests in the outer inch zone of the sheet was determined and recorded as a percentage of the total number in that zone. The percentage

TABLE III
COMPARATIVE DATA ON ROUND AND RECTANGULAR SHEETS AND ON SQUARE SHEETS CUT FROM THEM

| Pulp number and type | Machine size | Sheet shape and drying accessories | Average standard deviation of single test, per cent | Standard deviation of average, per cent | Ratio of low tests |
|---|---|---|---|---|---|
| 1. Unbleached sulphite unbeaten | Large | Round | | | |
| | | Blotters | 9.3 | 7.3 | 0.5 |
| | | Plates | 7.9 | 3.2 | .8 |
| | | Square | | | |
| | | Blotters | 6.5 | 3.1 | .7 |
| | | Plates | 7.8 | 2.0 | 1.3 |
| | Large | Rectangular | | | |
| | | Blotters | 8.1 | 2.6 | .5 |
| | | Plates | 9.4 | 7.2 | .3 |
| | | Square | | | |
| | | Blotters | 7.0 | 4.4 | .6 |
| | | Plates | 6.9 | 2.6 | .7 |
| | Small | Round | | | |
| | | Blotters | 4.9 | 2.8 | .7 |
| | | Plates | 6.0 | 3.0 | .55 |
| 2. Unbleached sulphite well beaten | Large | Round | | | |
| | | Blotters | 6.7 | 2.0 | .3 |
| | | Plates | 7.6 | 1.9 | .4 |
| | | Square | | | |
| | | Blotters | 7.1 | 1.5 | 1.2 |
| | | Plates | 5.7 | 3.4 | .8 |
| | Large | Rectangular | | | |
| | | Blotters | 7.9 | 1.5 | .8 |
| | | Plates | 7.3 | 2.5 | .8 |
| | | Square | | | |
| | | Blotters | 7.8 | 2.3 | 1.0 |
| | | Plates | 7.6 | 3.0 | .8 |
| 3. Unbleached sulphite highly beaten | Large | Rectangular | | | |
| | | Blotters | 6.6 | 1.7 | .5 |
| | | Square | | | |
| | | Blotters | 7.1 | 2.7 | .9 |
| | Small | Round | | | |
| | | Blotters | 7.6 | 2.5 | .45 |
| | | Plates | 6.3 | 1.2 | .65 |
| 4. Unbleached sulphite highly beaten | Large | Rectangular | | | |
| | | Blotters | 9.2 | 3.4 | .7 |
| | | Blotters under tension | 9.0 | 4.5 | .4 |
| | Small | Round | | | |
| | | Blotters | 4.8 | 1.6 | 1.0 |
| | | Plates | 5.8 | 2.6 | .9 |

of low tests in the balance of the sheet was likewise determined. The ratio of these percentages is taken as a measure of the relative uniformity of the two zones. If the ratio is near unity, they are about alike; if less, the outer zone of the sheet carries the greater proportion of low tests; if more, the inner zone. The only conclusion that can be drawn from these ratios is that small sheets tend to be more uniform throughout their area than do large ones.

It is of interest to calculate the actual ratio of strengths in the outer and inner zones of the sheet. This was found to fall generally in the neighborhood of 0.99. There are, then, not only low tests but also compensating high tests in the outer zone of the sheet. It is difficult to understand how these could be caused by shrinkage; hence it might be said that there was evidence of poor formation around the edge of the sheet, caused by faulty machine design.

### Couching and Pressing Effects

The experiments on couching were done after the general tests on the machines had shown variations possibly ascribable to couching differences. Since they are of use in connection with the results of the other tests, they will be presented first.

One hundred and twenty sheets of a medium-beaten sulphite pulp (No. 5) were made and grouped in 6 sets, each of which was couched in a different way. Each set of sheets was pressed as two subsets. The analysis of results is given in Table IV.

TABLE IV
ANALYSIS OF COUCHING AND PRESSING EFFECTS FOR PULP NO. 5 (UNBLEACHED SULPHITE, PARTIALLY BEATEN)

| Set | Sub-set | Couching mechanism | Bursting strength | Standard deviation of the single test | Standard deviation of the sheet average: Observed | Standard deviation of the sheet average: Calculated | Ratio of observed to calculated |
|---|---|---|---|---|---|---|---|
| | | | Pts./lb./ream | Per cent | Per cent | Per cent | |
| 1 | A | Heavy couch roll | 0.356 | 5.2 | 1.5 | 1.3 | 1.2 |
| | B | | .348 | 5.0 | 2.1 | 1.2 | 1.7 |
| 2 | A | Heavy couch roll | .348 | 5.3 | 1.5 | 1.3 | 1.1 |
| | B | and couch plate | .346 | 4.9 | 1.9 | 1.2 | 1.6 |
| 3 | A | Light couch roll | .363 | 5.2 | 1.9 | 1.3 | 1.5 |
| | B | | .361 | 4.9 | 1.8 | 1.2 | 1.5 |
| 4 | A | Light couch roll | .347 | 4.7 | 2.9 | 1.2 | 2.4 |
| | B | and couch plate | .347 | 4.5 | 3.2 | 1.1 | 2.9 |
| 5 | A | Flat plate pressure | .363 | 4.7 | 1.3 | 1.1 | 1.2 |
| | B | 5 lb./sq. in. | .371 | 4.4 | 1.7 | 1.1 | 1.6 |
| 6 | A | Flat plate pressure | .379 | 4.2 | 2.3 | 1.1 | 2.2 |
| | B | 20 lbs./sq. in. | .374 | 4.6 | 2.2 | 1.2 | 1.9 |

The figures for standard deviation of the single test show little effect due to couching procedure; the sheets made with a light roll and plate, and with flat plate pressure were slightly but not significantly more uniform than the others. The differences in duplicability of the sheets, however, are marked. The low flat plate pressure and the heavy couch roll and plate are clearly better than heavy flat pressure or light couch roll with plate, and somewhat better than the other two methods.

Pressing should not affect the uniformity of the sheets greatly, nor should it have much effect on the duplicability of sheets pressed all at one time. The difference between duplicate pressings is, however, a part of the difference of results obtained by different operators. In four cases out of six, the pressing was satisfactorily duplicated; but in sets 1 and 5 of Table IV, there was a demonstrably significant difference in the duplicate pressings. On the basis of this limited evidence, differences of more than 2 or 3 per cent in average results between different operators should be ascribed to pressing differences, and not to sheet machine operation.

### Comparison of All Machines

From each of five pulps 20 sheets were made on each of the machines by a single operator using one procedure, and an additional 10 or 20 sheets on machine No. 5 (designated in this instance as machine No. 5-A) using its standard procedure, as already noted. Half of these sheets were tested for bursting, the other half for tearing strength. For the bursting strength measurement the quadrangular sheets were cut diagonally, the round ones on a diameter, and 8 Ashcroft tests made on each half, spaced evenly along the cut edge. It should be noted that this method of testing would tend to minimize somewhat the effect of poor edge structure.

Ten sheets were also made on each machine from two pulps by three other operators, two of whom were inexperienced in this type of work. These were tested for bursting strength only.

Sufficient data are therefore at hand to compare the five machines, (one operated in two ways) for uniformity and duplicability of sheets made by one operator and for reproducibility by several operators.

### Uniformity of Sheets

The actual bursting and tearing strength values (averages of 10 sheets) obtained with the several machines are given in Table V, while the percentage standard deviations of the single tests are recorded in Table VI.

TABLE V
BURSTING AND TEARING TEST VALUES

| Pulp No. | Pulp type | Machine 1 | 2 | 3 | 4 | 5 | 5-A |
|---|---|---|---|---|---|---|---|
| | Bursting strength—Points per pound per ream | | | | | | |
| 6 | Kraft, unbeaten | 0.323 | 0.317 | 0.293 | 0.320 | 0.305 | 0.339 |
| 7 | Bleached sulphite, unbeaten | .193 | .218 | .186 | .189 | .199 | .212 |
| 8 | Mechanical | .219 | .213 | .221 | .209 | .231 | .254 |
| 9 | Rag, partly beaten | .699 | .738 | .716 | .788 | .764 | .758 |
| 10 | Unbleached sulphite, highly beaten | .670 | .768 | .745 | .740 | .768 | .735 |
| | Total | 2.104 | 2.254 | 2.161 | 2.246 | 2.267 | 2.298 |
| | Tearing strength—Grams per pound per ream | | | | | | |
| 6 | Kraft, unbeaten | 2.21 | 2.29 | 2.33 | 2.60 | 2.36 | 2.71 |
| 7 | Bleached sulphite, unbeaten | 1.56 | 1.60 | 1.50 | 1.45 | 1.45 | 1.67 |
| 8 | Mechanical | .61 | .65 | .69 | .62 | .68 | .67 |
| 9 | Rag, partly beaten | 4.83 | 5.05 | 4.96 | 5.12 | 5.45 | ... |
| 10 | Unbleached sulphite, highly beaten | 1.02 | 1.09 | 1.12 | 1.04 | .99 | 1.00 |
| | Total | 10.23 | 10.68 | 10.60 | 10.84 | 10.94 | ... |

TABLE VI
UNIFORMITY OF THE SINGLE SHEET, BASED ON STANDARD DEVIATION OF THE TEST VALUES

| Pulp No. | Pulp type | Machine 1 | 2 | 3 | 4 | 5 | 5-A |
|---|---|---|---|---|---|---|---|
| | Per cent standard deviation of the bursting test value | | | | | | |
| 6 | Kraft, unbeaten | 6.0 | 5.1 | 6.3 | 4.5 | 7.5 | 6.8 |
| 7 | Bleached sulphite, unbeaten | 7.6 | 5.1 | 6.9 | 5.5 | 5.6 | 7.0 |
| 8 | Mechanical | 5.5 | 5.6 | 6.1 | 6.1 | 5.6 | 4.7 |
| 9 | Rag, partly beaten | 11.5 | 10.6 | 9.0 | 11.3 | 11.4 | 12.5 |
| 10 | Unbleached sulphite, highly beaten. | 7.3 | 7.7 | 7.0 | 8.1 | 6.3 | 8.4 |
| Average | | 7.6 | 6.8 | 7.1 | 7.1 | 7.3 | 7.9 |
| Average, 3 other operators pulps 7 and 10 | | 5.7 | 4.8 | 6.5 | 5.4 | 5.7 | |
| | Per cent standard deviation of the tearing test value | | | | | | |
| 6 | Kraft, unbeaten | 12.4 | 13.0 | 12.6 | 11.4 | 14.2 | 16.8 |
| 7 | Bleached sulphite, unbeaten | 10.2 | 14.1 | 16.5 | 13.7 | 13.6 | 13.3 |
| 9 | Rag, partly beaten | 7.5 | 8.3 | 8.4 | 10.7 | 10.8 | ... |
| 10 | Unbleached sulphite, highly beaten. | 6.8 | 8.7 | 10.0 | 7.6 | 5.1 | 6.9 |
| Average | | 9.9 | 10.8 | 10.9 | 10.3 | 10.6 | 11.4 |

(8) Nippe, W., Papier-Fabr. 29, 418-30 (1931); Chem. Abstracts 26, 593

The average strength values obtained with the different machines differ somewhat, as might be expected. There are no regularities in the individual results worthy of note. The spread between maximum and minimum values in the table ranges from 12 per cent for the rag stock to 20 per cent for the mechanical pulp. Reference to this will be made later in connection with the reproducibility.

The standard deviation figures cannot be interpreted as showing any great differences in average sheet uniformity among the several machines. With individual stuffs one or another machine may show a slight advantage, but these are hardly significant, in the absence of any general trends.

Table VI includes average figures for the uniformity of the individual sheets produced by three other operators using the pulps 7 and 10. These figures agree with those obtained by the single operator in that there is no significant difference in uniformity of sheets made on different machines.

### Duplicability of Sheets

The standard deviations of the average bursting and tearing strength tests on the several pulps are recorded in Table VII. In this table an actual difference among the machines begins to be apparent. The different reactions of the machines to the different pulps also appear. Considering the average values, when the machines are arranged in order, gradations between them are small, but there is a definite difference between the best and the poorest machines. Both in bursting and tearing strength the machine No. 5 ranks as best, and so far as tearing strength is concerned the use of standard procedure (No. 5-A) is somewhat advantageous. The excellent rating of the machine No. 4 in the bursting-strength class is due entirely to the extremely low variability of the average for mechanical pulp.

TABLE VII
DUPLICABILITY OF SHEETS BY ONE OPERATOR, BASED ON STANDARD DEVIATIONS OF SHEET AVERAGES

| Pulp No. | Pulp type | Machine 1 | 2 | 3 | 4 | 5 | 5-A |
|---|---|---|---|---|---|---|---|
| | Per cent standard deviation of the average burst | | | | | | |
| 6 | Kraft, unbeaten | 1.8 | 2.0 | 2.6 | 3.3 | 3.7 | 1.6 |
| 7 | Bleached sulphite, unbeaten | 3.2 | 3.5 | 2.2 | 3.6 | 2.5 | 1.2 |
| 8 | Mechanical | 4.3 | 3.4 | 4.8 | 0.7 | 2.8 | 2.6 |
| 9 | Rag, partly beaten | 4.4 | 3.5 | 1.8 | 2.1 | 1.7 | 4.3 |
| 10 | Unbleached sulphite, highly beaten. | 4.6 | 2.9 | 2.5 | 2.7 | 1.9 | 3.2 |
| Average | | 3.7 | 3.1 | 2.8 | 2.5 | 2.5 | 2.6 |
| Average of 3 operators using pulps 7 and 10 | | 3.5 | 2.7 | 2.7 | 2.7 | 2.8 | .. |
| | Per cent standard deviation of the average tear | | | | | | |
| 6 | Kraft, unbeaten | 7.1 | 6.2 | 8.1 | 6.5 | 6.4 | 6.4 |
| 7 | Bleached sulphite, unbeaten | 7.3 | 9.8 | 6.8 | 6.4 | 6.4 | 4.4 |
| 8 | Mechanical | 6.1 | 5.7 | 4.9 | 6.1 | 4.5 | 3.5 |
| 9 | Rag, partly beaten | 3.5 | 5.5 | 3.4 | 5.3 | 4.4 | .. |
| 10 | Unbleached sulphite, highly beaten.. | 2.8 | 2.9 | 4.7 | 2.4 | 3.4 | 4.4 |
| Average | | 5.4 | 6.0 | 5.6 | 5.3 | 5.0 | 4.7 |

It is plain that the machines do not perform equally well with all pulps, even if the exceptional case of the machine No. 4 is eliminated. Thus the machine No. 5-A gives excellent duplicability of bursting strength with the mechanical and unbeaten chemical pulps. For pulps Nos. 9 and 10, which give abnormal shrinkage on drying, the sheets from machine No. 5 were as good or better than any others as far as duplicability was concerned. In the duplicability of tearing strength also, though the machine No. 5-A is inferior to some others on special pulps, it is the best for overall performance.

The average standard deviations of the average bursting strength test for the three other operators on each of two pulps are included in Table VII. Here one machine turns out to be definitely the poorest, while the differences between the other machines have been flattened out.

### The Specific Nature of Pulps

One fact which has already been mentioned is worthy of more emphasis; that is, the difference in behavior of pulps, regardless of the machine on which the sheets were made. Standard deviations can be averaged for pulps instead of machines, with interesting results. In order of decreasing uniformity of sheets the pulps stand in the order 10, 9, 8, 6, 7, by the tearing test, and 8, 6, 7, 10, 9 by the bursting test. The order of decreasing duplicability is 10, 9, 8, 6, 7 and 6, 7, 10, 9, 8, respectively. The differences and the quantity of data are great enough to show plainly that those pulp characteristics which tend to make a sheet, on any machine, of uniform or duplicable tear are not the same as those tending to produce uniform or duplicable burst. Moreover, the pulp characteristics promoting sheet uniformity do not necessarily promote duplicability.

### Reproducibility of Average Test Values by Several Operators

So far it has been shown that as regards uniformity of sheets there is little to choose between the machines, while on the duplicability basis there is some advantage to one or another machine. Also, it has been shown that the machines will show about the same degree of sheet uniformity no matter who operates them, while the duplicability rating varies with the operator to some extent.

One question needs, however, to be settled; namely, how closely a number of operators, or one operator on different occasions, can reproduce actual test results. It appeared from the study of couching and pressing effects that unavoidable pressing variations between duplicate sets of sheets might run as high as 2 or 3 per cent. It was also pointed out in connection with Table V that there was a range of 12 to 20 per cent in strength values between the different machines. Part of this, of course, is ascribed simply to unavoidable variations in pressing. It is of considerable importance to know if the values obtained on one machine by several operators are more or less variable than those obtained on several (different) machines by one operator when using, as was done in this work, a standardized pressing and drying procedure. A partial answer to this is found by comparing the range of results obtained by four operators on each of two pulps, as recorded in Table VIII.

TABLE VIII
REPRODUCIBILITY OF AVERAGE TEST BY FOUR OPERATORS

| Pulp No. | Pulp Type | Machine 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| | | Per cent range of average test by four operators | | | | |
| 7 | Bleached sulphite, unbeaten | 8 | 7 | 29 | 30 | 29 |
| 10 | Unbleached sulphite, highly beaten | 8 | 17 | 7 | 6 | 5 |

The results are perhaps too limited to be conclusive. In the actual data there was some evidence that one operator would get consistently lower results than the others on all machines, so that the differences may be due to inexpert manipulation in pressing. On the whole, it is questionable if the machines used cover a range of difference as great as would be obtained by several operators on one machine, but this requires more proof. It seems reasonable to suppose that the machine giving the best duplicability should give the best reproducibility and in about the same ratio.

The tendency of random errors to balance one another when fairly large samples are taken is shown by the two sets of totals given in Table V. There is a range of 7 per cent both in burst and in tear values between machines 1 and 5, with the other machines grouped in regular order. This may be taken as fairly representative of the true differences in actual test values inherent in the machines. The larger differences in Tables V and VIII are random errors of machine press, and operator, to which one machine is not appreciably more likeable than any other.

### Discussion of Results

Three of the machines used in this work were also compared by the Canadian Forest Products Laboratories *(1)*. By means of the standard deviation figures on the average test these machines can be ranked on an arbitrary percentage scale, and a similar rating can be derived from the Canadian data.

When this is done, combining all tests, the machines are ranked for duplicability of sheets as follows:

COMPARATIVE RANKING OF THREE MACHINES

| Laboratory | |
|---|---|
| U. S. | Canadian |
| 100 | 100 |
| 87 | 96 |
| 80 | 70 |

The agreement is, all things considered, excellent. It must be emphasized that this scale is purely arbitrary.

The results obtained by Laymon *(6)* cannot be treated in exactly this way. He compared the results using the British method with those of the Mead method, which closely parallels one TAPPI standard *(12)*. His results are the exact reverse of those here presented. The fact that a pressure of 200 pounds per square inch is used in the Mead method may supply the reason for this difference.

By way of a contrast with the results of the Canadian tests, no trouble was met in the present work in couching bleached sulphite sheets, nor did many of the sheets have to be discarded as unfit for testing. Formation of the sheets, as observed visually, showed little differentiation between the machines when slow stuffs were used. With free pulps, those machines using a fine-mesh wire and high dilution of stock gave the best appearing sheets.

Considerable trouble was met in forming sheets from highly diluted and very slow stock. The adoption of a standard drainage time, as recommended by Genberg and Laymon *(12)* rather than a standard dilution, seems desirable. Each of the machines has its structural peculiarities and failings which are naturally perhaps more marked in the newer and more complex machines. The means of leveling, dilution, agitation, seal on the wire, are important features; mesh and support of wire need to be further standardized. In auxiliary equipment, some of the presses are cumbersome to operate, and the use of drying plates in one or another form needs further study. In particular, with stuffs showing high shrinkage, it was hard to make the sheets adhere to the plates on drying. If an M. G. finish is required for test sheets, the operation should be improved.

Several points stand out in the experimental data. The comparison of sheet form, though not positive enough in results to permit rejection of either type of machine, indicates that both poor edge formation and shrinkage on drying are sources of erratic results, and that these factors are least serious in small, circular sheets. There appears to be a best couching pressure, and it is plain that pressing must be most carefully controlled if sheets are to be made alike.

There is a large difference in speed of operation of the machines, due mainly to differences in couching and pressing procedure, also in part to differences in drainage time. In general, the slower operations give the more precise results, so that for equal precision less sheets need be used; hence in a complete sheetmaking and testing cycle there would be little difference in time required.

Within the limits of adaptability and speed already mentioned, and of the experimental procedure, machines 5 or 5A are somewhat the best of those tested. In no case, however, are the differences in accuracy of results extreme. Because of the small differences and the limited (from the statistical standpoint) amount of data, it is necessary to accept the conclusions presented with reservations which can be better understood if some of the limitations of the statistical method are indicated.

To make the available data yield a maximum amount of information the methods of statistical analysis have been employed.

The statistic used, the standard deviation, may be applied in several ways. First, as a measure of dispersion: a range of average plus or minus the standard deviation indicates the limits within which a certain percentage of results should fall. If a set of values obtained by one method showed a standard deviation of 4, and another of 2, in 100, although one is twice as uniform as the other the actual increase of accuracy might not be important. Second, as a measure of necessary testing: the number of tests required to give any selected precision of the average varies as the square of the standard deviation. Then in the case above, for equal precision four times as many tests would be required by the first method as would be required by the second. This may well be of considerable practical importance. Third, in connection with its own variability: a specific example of this may be given in connection with the values for standard deviation of the single bursting strength test of six sets of kraft sheets given in Table VI, first line.

At first sight it might be said that the machine No. 4 made the most uniform sheets of this pulp. But, on purely theoretical grounds, with one machine giving sheets with a normal or average standard deviation of 6.0 (the average of this group), a standard deviation of 4.5 or 7.5 would be expected once in every three or four sets of sheets made. For a positive conclusion, several sets of sheets would have to be made of this pulp on all the machines. There is one chance in six that any one machine in the group would be the best in one series of tests, one in 36 that it would be the best in two, one in 216 that it would be the best in each of three series, and so on. So, if one machine gave a lower standard deviation of the single test value than any of the others in each of four or five series of tests, the statement that it produced the most uniform sheets could be made with safety.

### Conclusions

The differences among the machines are, in general, so slight that in order to make a completely quantitative classification a much greater volume of data, for precise statistical treatment, should be compiled than was possible in this work. Recognizing this limitation the following conclusions can be drawn:

1. The uniformity of test sheets varies with the stock used, each machine ranking somewhat differently depending on this factor. However, considering the average uniformity (based on bursting test values) of the center area of the sheet, no significant difference is evident in the test sheets regardless of the machine on which they were made. In other words, the center area of sheets from all the machines tested is of similar uniformity (despite an apparent visual nonuniformity in some instances) and elimination of the outer or peripheral portion will result in sheets of equal uniformity regardless of the machine on which they are produced. On the other hand, if the total sheet area is considered, small round sheets show some evidence of superiority.

2. The duplicability of sheets made by an experienced operator depends to a considerable extent upon the pulp used. For a large range of pulps the several machines differ significantly (again using the bursting test values as criteria). The machines 4 and 5 gave standard deviations

in the average test of 2.5, the machine No. 3, 2.8, the machine No. 2, 3.1 and the machine No. 1, 3.7 per cent. In the case of tearing strength values the standard deviations were 5.3, 5.0, 5.6, 6.0 and 5.4, respectively. The duplicability of sheets made by a large group of operators tends to average out these values, so that no particular machine appears greatly superior. This latter observation is, however, based on rather meager data.

3. Reproducibility of average test results by various operators and at various times should be of the same order as duplicability of sheets. This is merely an assumption, however, unsupported by any data compiled in this particular study, and would require an extension of work for proof.

4. The absolute values of the test results differ significantly between different machines, when large numbers of tests are averaged, but for smaller numbers of tests these differences are obscured by random errors.

5. In speed of operation (considering both the time of making and testing the sheets) the machine No. 5-A possesses a definite superiority over the other machines when used with the two stuffs to which it is particularly adapted, namely, mechanical and unbeaten chemical pulps. Although its actual operation is slow the number of sheets required to produce an average of any desired precision, based on duplicability, is less than required on any other machine except, in one case, machine No. 4. For instance, using a mechanical pulp only half as many sheets, and using an unbeaten bleached sulphite only one-fourth as many sheets need be tested to obtain the same precision as would be the case using the next best machine.

6. In applicability to all materials no one machine was found entirely satisfactory.

7. Differences due to machine design seem to be less important than those due to variations in operation and in pressing and drying the sheets. A single suitably designed and carefully followed procedure should lead to comparable results regardless of the machine used, at least for the purposes of ordinary testing work.

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## S. Goldmeyer Joins Zeloid Co.

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., December 19, 1933—Announcement was made this week that Sigmund Goldmeyer, who has been connected with the DuPont concern as engineer for the designing of machinery for cellophane papers, had been secured by the Zeloid Products Company, now believed to be near its goal for making transparent papers. It is understood that J. & W. Jolly, Inc., of this city, are to be given the contract for the first machine, which is to be housed in the Riverside No. 1 paper mill, now out of commission for paper manufacturing purposes. Mr. Goldmeyer is expected to be here to superintend the construction of the first machinery next month.

## Feldmuhle Joins TAPPI

Papier und Zellstoffwerke Aktiengesellschaft Feldmuhle of Stettin, Prussia, Germany, one of the outstanding paper manufacturers of Europe is the most recent company to become a corporate member of the Technical Association of the Pulp and Paper Industry.

Mills of this great company are located at Odermunde and Hohenkrug (Silesia), Reisholz, Fleusburg, Uetersen and Armsburg (Ruhrwerke), Sackheim and Cosse (Prussia), Billegossen and Oberlahnsterin (Rhein), Esseling and Lulsdorf.

All kinds of bag papers (extra strong and highly finished), M. G. and unglazed sulphites (bleached and unbleached) krafts (pure and imitation), M. G. sulphite tissues, unglazed sulphites, greaseproofs, glazed transparents, real vegetable parchment papers, hygienic towels, paper towels and napkins, news, writings and printings, manifolds, wood pulp board, imitation chromo boards, folding box boards, newsboards, transparent viscose foils and strong easy bleaching sulphite pulp are among the products made.

The company has 30 paper machines and makes 860 tons of paper and 610 tons of pulp daily.

The company will be represented in TAPPI by Hans Gottstein, general director of the company, who has been a member of the association since 1929, and was formerly associated with the Hammermill Paper Company at Erie, Pa.

## New TAPPI Members

Th Executive Committee of the Technical Association of the Pulp and Paper Industry have announced the following elections to membership:

John R. Kimberly, chief planner for the Kimberly-Clark Corporation, Neenah, Wis., attended the Massachusetts Institute of Technology and has been associated with his present company since 1924.

Roger W. Hooker, assistant sales manager of the Hooker Electrochemical Company, New York, is a 1921 graduate of Cornell University and was formerly with the Beaver Board Company, Buffalo, N. Y.

Donald I. Gross, chemical engineer for the American Enka Company, Asheville, N. C., has been advanced from Associate to Active membership in the Technical Association.

Geoffrey C. Norman, beater room foreman of Pacific Mills Ltd., Ocean Falls, B. C. has been with this company since 1929.

Walter S. Hodges, Portland, Ore., sales representative for Appleton Wire Works, Appleton Woolen Mills, American Wringer Company and the Asten-Hill Manufacturing Company has been reinstated to membership.

George C. Pauline, laboratory assistant for the Alliance Paper Mills, Merritton, Ont., is a graduate of Ridley College, St. Catharines, Ontario.

## Now Port Huron Xylite Co.

The Port Huron Xylite Company, compounders of H. M. P. greases, oils and soaps, with factory at 1024 Eleventh avenue, Port Huron, Mich., has succeeded the G. B. Stock Xylite Grease and Oil Company. The greases manufactured by the company are the purest of lubricants, being compounded from mineral, animal and vegetable oils and contain no ingredients that are in any way injurious to the journals or bearings. Quotations will be sent on request.

# IMPORTS OF PAPER AND PAPER STOCK

## NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

### NEW YORK IMPORTS

WEEK ENDING DECEMBER 16, 1933

CIGARETTE PAPER

Champagne Paper Corp., McKeesport, Havre, 546 cs.; Liggett & Myers Tobacco Co., McKeesport, Havre, 334 cs.; ——, Ascania, Southampton, 44 cs.; Standard Products Corp., Ile de France, Havre, 135 cs.; Champagne Paper Corp., Ile de France, Havre, 713 cs.

WALL PAPER

F. J. Emmerich, St. Louis, Hamburg, 4 cs., 21 bls.; Schmidt & Pritchard, St. Louis, Bremen, 1 ble.; S. K. Lonegrin, Kungsholm, Gothenburg, 6 cs.

PAPER HANGINGS

W. H. S. Lloyd & Co., Amer. Importer, London, 2 bls.

NEWS PRINT

Star Co., Markland, Liverpool, N.S., 1007 rolls; N. Y. Tribune, Inc., Markland, Liverpool, N.S., 1388 rolls; World Telegram, Markland, Liverpool, N.S., 570 rolls; B. J. Warren, Markland, Liverpool, N.S., 78 rolls; Clinton Paper Corp., Markland, Liverpool, N.S., 633 rolls; Perkins Goodwin & Co., Washington, Hamburg, 93 rolls; ——, Washington, Hamburg, 93 rolls; Perkins Goodwin & Co., St. Louis, Hamburg, 158 rolls; Jay Madden Corp., St. Louis, Bremen, 136 rolls; Bank of Montreal, Humberarm, Corner Brook, 2964 rolls; Perkins Goodwin & Co., Hamburg, Hamburg, 672 rolls; Jay Madden Corp., Hamburg, Hamburg, 144 rolls; Jay Madden Corp., Scanstates, Helsingfors, 210 rolls.

PRINTING PAPER

P. C. Zuhlke, Westernland, Antwerp, 27 cs.; Ozalid Corp., Breedyk, Rotterdam, 31 cs.

WRAPPING PAPER

R. Wilson Paper Corp., Westernland, Antwerp, 2 cs.

PACKING PAPER

F. C. Strype, St. Louis, Hamburg, 70 cs.; Scharf Bros. Co. Inc., Breedyk, Rotterdam, 4 cs.

FILTER PAPER

H. Reeve Angel & Co. Inc., Ascania, Southampton, 3 cs.; J. Manheimer, Berengaria, Southampton, 146 bls.

TISSUE PAPER

F. C. Strype, Britannic, Liverpool, 5 cs.; W. J. Byrnes, Ascania, Southampton, 2 cs.

DECALCOMANIAS

Sellers Transportation Co., St. Louis, Hamburg, 6 cs.; Sellers Transportation Co., Europa, Bremen, 31 cs.; L. A. Consmiller, Europa, Bremen, 8 cs.

SURFACE COATED PAPER

Chas. Happel, Washington, Hamburg, 7 cs.; Globe Shipping Co., St. Louis, Bremen, 84 cs., 77 crates; P. C. Zuhlke, Westernland, Antwerp, 25 cs.; Gevaert Co. of America, Westernland, Antwerp, 21 cs.; Globe Shipping Co., Europa, Bremen, 4 cs.; Globe Shipping Co., Hamburg, Hamburg, 58 crates.

METAL COATED PAPER

K. Pauli Corp., St. Louis, Hamburg, 30 cs.; Globe Shipping Co., St. Louis, Bremen, 55 cs.; Globe Shipping Co., Hamburg, Hamburg, 15 cs.; K. Pauli Corp., Hamburg, Hamburg, 27 cs.

COATED PAPER

Chas. Happel, Hamburg, Hamburg, 14 cs.

BASIC PAPER

P. Puttmann, Westernland, Antwerp, 8 cs.

PHOTO PAPER

American Express Co., St. Louis, Hamburg, 13 cs.; American Express Co., Hamburg, Hamburg, 26 cs.

TRANSFER PAPER

Atlantic F'd'g. Co., Washington, Hamburg, 22 cs.; F. L. Kraemer, St. Louis, Bremen, 10 cs.

LITMUS PAPER

Pfalz & Bauer, Washington, Hamburg, 1 cs.

PAPER BOARD

Colmar Paper Corp., Westernland, Antwerp, 12 cs.

PASTE BOARD

American Express Co., Ile de France, ——, 30 bdls.

STRAW BOARD

Famous Paper Box Co., Breedyk, Rotterdam, 800 pkgs.

MISCELLANEOUS PAPER

Henschel Naeve Co., St. Louis, Bremen, 28 cs.; ——, St. Louis, Bremen, 7 cs.; Japan Paper Co., N. Maersk, Kobe, 49 cs.; The Borregaard Co. Inc., Kungsholm, Gothenburg, 124 rolls 5 bls.; Kaemer & Co., Kungsholm, Gothenburg, 137 bls.; American Express Co., Hamburg, Hamburg, 7 cs.; C. Schleicher & Schull Co. Inc., Hamburg, Hamburg, 14 cs., 4 bls.; ——, Hamburg, Hamburg, 14 bls.; Japan Paper Co., Breedyk, Rotterdam, 3 cs.

RAGS, BAGGINGS, ETC.

——, Cameronia, Glasgow, 23 bls. paper stock; Darmstadt Scott & Scott, McKeesport, Dunkirk, 73 bls. bagging; Van Oppen & Co., McKeesport, Havre, 200 bls. bagging; A. W. Fenton, Inc., Lehigh, Manchester, 6 bls. rags; Banco Coml Italiane Trust Co., Lehigh, Manchester, 107 bls.

rags; Darmstadt Scott & Courtney, Lehigh, Manchester, 120 bls. new cuttings; ——, Lehigh, Leith, 40 bls. strings; E. J. Keller Co. Inc., N. Maersk, ——, 100 bls. rags; E. J. Keller Co. Inc., Excalibur, ——, 214 bls. rags: E. J. Keller Co. Inc., Excalibur, ——, 66 bls. bagging; Amtorg Trading Corp., Scanstates, Leningrad, 1716 bls. rags; Chase National Bank, St. Louis, Bremen, 13 bls. thread waste.

OLD ROPE

——, Estrella, Barcelona, 39 bls.; T. D. Downing & Co., Ascania, Southampton, 107 coils; Banco Coml Italiane Trust Co., Breedyk, Rotterdam, 125 coils.

CHINA CLAY

Whitaker Clark & Daniels, Britannic, Liverpool, 390 bags.

CASEIN

D. C. Andrews & Co., St. Louis, Hamburg, 70 bags; D. C. Andrews & Co., Hamburg, Hamburg, 70 bags.

WOOD PULP

Castle & Overton, Inc., Black Eagle, Rotterdam, 420 bls. wood pulp, 84 tons; Castle & Overton, Inc., St. Louis, Hamburg, 910 bls. wood pulp, 182 tons; E. J. Keller Co. Inc., Washington, ——, 686 bls. wood pulp; Johaneson Wales & Sparre, Inc., Kungsholm, Gothenburg, 250 bls. sulphate; Johaneson Wales & Sparre, Inc., Kungsholm, Gothenburg, 254 bls. sulphite; Perkins Goodwin & Co., Kungsholm, Gothenburg, 254 bls. sulphite; Perkins Goodwin & Co,. Kungsholm, Gothenburg, 381 bls. sulphate; Gottesman & Co. Inc., Kungsholm, Gothenburg, 2400 bls. sulphate; Pagel Horton & Co. Inc., Argosy, Sikea, 1800 bls. sulphite; Perkins Goodwin & Co., Argosy, Sundsvall, 1800 bls. sulphite; E. J. Keller Co. Inc., Argosy, ——, 335 bls. wood pulp, 50 tons; ——, Hamburg, Hamburg, 166 bls. wood pulp, 25 tons; Irving Trust Co., Hamburg, Hamburg, 150 bls. wood pulp; Castle & Overton, Inc., Breedyk, Rotterdam, 680 bls. wood pulp; J. Manheimer, Breedyk, Rotterdam, 30 bls. wood pulp; Lagerloef Trading Co., Scanstates, Helsingfors, 589 bls. sulphite, 98 tons; Lagerloef Trading Co., Scanstates, Helsingfors, 381 bls. mechanical, 76 tons.

WOOD PULP BOARDS

Heidelbach Ickelheimer & Co., Black Eagle, Rotterdam, 152 bls., 38 tons.

## ALBANY IMPORTS

WEEK ENDING DECEMBER 16, 1933

Halifax Power & Pulp Co., Dago, Sheet Harbor, 7662 bls. mechanical pulp, 1716 tons.

## PORTLAND IMPORTS

WEEK ENDING DECEMBER 16, 1933

Gottesman & Co. Inc., Mirrabooka, Sweden, 7200 bls. wood pulp.

## BOSTON IMPORTS

WEEK ENDING DECEMBER 16, 1933

E. J. Keller Co. Inc., Westerwald, ——, 343 bls. wood pulp; Parsons & Whittemore, Inc., Westerwald, ———, 250 bls. sulphate; Gottesman & Co. Inc., Westerwald, Czecho Slovakia, 680 bls. wood pulp.

## PHILADELPHIA IMPORTS

WEEK ENDING DECEMBER 16, 1933

Chase National Bank, N. Maersk, Kobe, 25 bls. rags; D. Galloway, N. Maersk, Kobe, 100 bls. cotton waste; E. J. Keller Co. Inc., Excalibur, ——, 110 bls. rags; Price & Pierce, Ltd., Argosy, Orviken, 3000 bls. chemical pulp, 500 tons; Irving Trust Co., Argosy, Sundsvall, 240 bls. mechanical pulp; Perkins Goodwin & Co., Argosy, Sundsvall, 1500 bls. sulphate; Perkins Goodwin & Co., Argosy, Sundsvall, 900 bls. sulphite; E. J. Keller Co. Inc., Argosy, ——, 336 bls. wood pulp, 50 tons; Johaneson Wales & Sparre, Inc., Argosy, Gdynia, 1542 bls. wood pulp, 232 tons; Amtorg Trading Corp., Scanstates, Leningrad, 113 bls. rags; Lagerloef Trading Corp., Scanstates, Helsingfors, 1433 bls. sulphite, 143 tons; Gilman Paper Co., Markland, Liverpool, 1445 rolls news print; Clinton Paper Corp., Markland, Liverpool, 265 rolls news print.

## WILMINGTON IMPORTS

WEEK ENDING DECEMBER 16, 1933

Price & Pierce, Ltd., Argosy, Orviken, 25800 bls. chemical pulp, 4300 tons.

## BALTIMORE IMPORTS

WEEK ENDING DECEMBER 16, 1933

Congoleum Nairn Co., McKeesport, Havre, 124 bls. rags; Congoleum Nairn Co., McKeesport, Dunkirk, 327 bls. rags; Parsons & Whittemore, Inc., C. of Havre, ——, 125 bls. sulphite; Parsons & Whittemore, Inc., C. of Hamburg, ——, 470 bls. sulphite; Parsons & Whittemore, Inc., Carlsholm, ——, 150 bls. sulphite; Gottesman & Co. Inc., T. Fagelund, Sweden, 7100 bls. wood pulp.

## NORFOLK IMPORTS

WEEK ENDING DECEMBER 16, 1933

Gottesman & Co. Inc., Etna, Sweden, 1000 bls. wood pulp.

## SAVANNAH IMPORTS

WEEK ENDING DECEMBER 16, 1933

——, N. Maersk, Shanghai, 209 bls. bagging.

## GALVESTON IMPORTS

WEEK ENDING DECEMBER 16, 1933

Parsons & Whittemore, Inc., Tripp, ——, 300 bls. sulphite.

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## Better Printing

The frequent "paper troubles" of letterpress printers are not recurrent but constantly attendant in offset printing unless all paper is conditioned. All parts of a sheet, and all sheets, in a job should be brought to the same temperature and relative humidity; and it is preferable to have the temperature and humidity the same as that of the pressroom.

In converting a part of its facilities from letterpress to offset The Maqua Company, printers at Schenectady, solved the problem of conditioning its offset papers by keeping its paper stock in a room within a room. Within the large room where the presses are located is a smaller room, filled with racks on which the paper is suspended. Along the walls of this room are additional stacks of paper ready for use.

In the corner of the room is a General Electric Type AD1 air conditioner. Ordinarily such conditioners heat, cool, humidify, dehumidify, filter and circulate the air in a room. In this installation the heating and cooling mechanisms are not used—the inner room is maintained at the same temperature as the press room.

On the wall are two humidistats. One shuts off the conditioner when the maximum optimum humidity is attained; the other starts the conditioner when the minimum desired humidity is registered. Some movement of the moist air is afforded by the conditioner itself; electric fans on the floor of the room increase the circulation.

## New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, December 20, 1933.

Conditions in the local paper market are improving. Although demand for the various standard grades of paper is light at present, inquiries for future account are more numerous and the outlook for the forthcoming year is decidedly promising. The price situation is practically unchanged.

The news print paper market is exhibiting better sentiment. Statistics gathered by the News Print Service Bureau show that production in North America during November amounted to 309,244 tons. The total United States and Canadian shipments were 287,931 tons. Stocks at the mills are the lowest in four years.

Trading in the local paper board market is satisfactory for the time of year. Box board is fairly active. Prices are steady to firm. The fine paper market is marking time until after the holidays. Some improvement is noticed in the coarse paper market and demand for kraft wrapping paper is better.

### Mechanical Pulp

The ground wood pulp market is practically unchanged. Production at home and abroad is being keyed to consumption and stocks at the mills are not excessive, with the result that the industry is in a sound statistical position. Quotations are generally holding to previously reported levels.

### Chemical Pulp

Business in the chemical pulp market is listless at the present time, due to seasonal causes, but should pick up materially early in the forthcoming year. The various foreign and domestic grades are steady, while kraft pulp is quite firm. Prices are generally holding to schedule, without difficulty.

### Old Rope and Bagging

The old rope market continues quiet. Demand for domestic and imported old manila rope is restricted. Small mixed rope is only moving slowly. The bagging market is dull. Little interest is being displayed in either scrap or gunny bagging. Roofing bagging is in moderate request. Bagging prices are spotty.

### Rags

Although the domestic rag market is experiencing its usual seasonal slackness, the export demand for new cotton rags is encouraging. No. 1 white shirt cuttings are especially strong. Roofing grades are marking time until after the new year gets under way. The imported rag market is still influenced by foreign exchange fluctuations.

### Waste Paper

The outlook for the local paper stock market is considered bright, due to the scarcity of offerings around. Board mill demand for No. 1 mixed paper and strictly folded news is well sustained. No. 1 white news is firmer and is now quoted at from $1.25 to $1.30. Hard and soft white envelope cuttings are steady. Book stock is rather quiet.

### Twine

Following the usual seasonal activity for holiday account, most of the business transacted in the local twine market during the past week was along routine lines. The movement of supplies into consumption has been fairly heavy of late. Despite the usual keen competition for desirable orders prices are holding up well.

## Special Centrifugal Pump Problems

A new bulletin on double-suction high-speed volute pumps has just been published by Morris Machine Works, who are the oldest American manufacturers of centrifugal pumps. This bulletin outlines the special problems that are involved in the design and construction of centrifugal pumps for operation at high speed, and describes in detail the features of the Morris Pumps that solve these problems.

The illustrations include a sectional view of the Morris design, and photographs of pumps with various driving units. Typical performance curves and a table of ratings and dimensions are also included.

These Morris Pumps may be direct-driven by either high-speed electric motors or steam turbines, may be furnished with pulley for belt drive, or supplied with speed increasers for geared connection to low-speed driving units such as internal combustion engines.

The pumps have many applications in industrial plants, central power generating stations, large buildings, and for special process work where a compact high-speed pumping unit is designed. Copies of the bulletin may be obtained by addressing Morris Machine Works, Badwinsville, New York.

## Pulp and Paper Makers' Directory Out

The *Paper and Pulp Makers' Directory* of Sweden, Norway, Denmark and Finland, Twelfth English Edition 1933-1934, is just off the press. Edited by Hugo Brusewitz Aktiebolag, with the co-operation of Fredrik Jahn, managing director of the Swedish Paper Mills' Association; Major Biorn Lyche, of Jens Lyche, paper merchants, Oslo; and Onni O. Ojala, editor of the *Finnish Paper and Timber Journal,* the form of the directory remains unchanged.

The mills are arranged alphabetically under the names best known in the trade. Such mills as are affiliated to a parent company are generally only to be found under the name of the latter. In the General Index, however, all the names are registered, and thus this index is to be employed when not finding a name in the alphabetical order of the book. The index of mills arranged according to the principal productions has been thoroughly revised.

The *Paper and Pulp Makers' Directory* may be obtained from the editors, Hugo Brusewitz Ab., Gothenburg, Sweden, at the price of Sw. Kr. 15.90 post free.

# Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, December 20, 1933.

BLANC FIXE.—The position of the blanc fixe market is practically unchanged. Prices are holding to schedule. The pulp is quoted at from $42.50 to $45.00 per ton, in bulk; while the powder is selling at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER.—Demand for bleaching powder is fairly persistent. The contract movement is well up to average. Prices are holding to formerly quoted levels, without difficulty. Bleaching powder is quoted at from $1.90 to $2.15 per 100 pounds, in drums, at works.

CASEIN.—The casein market is fairly active. Domestic standard ground is quoted at 12½ cents and finely ground at 13½ cents per pound. Argentine standard ground is selling at 15½ cents and finely ground at 16 cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Supplies of caustic soda are moving into consumption in good volume. Prices continue steady. Solid caustic soda is quoted at from $2.60 to $3.10; while the flake and ground are selling at from $3.00 to $3.05 per 100 pounds, in large drums, at works.

CHINA CLAY.—The china clay market is marking time, due to the uncertain foreign exchange situation. Imported china clay is quoted at from $12 to $17 per ton, ship side; while domestic paper making clay is selling at from $5 to $12 per ton, at mine.

CHLORINE.—Trading in the chlorine market is brisk. The contract movement is well up to average. Prices are holding to schedule. Chlorine is quoted at from $2.00 to $2.25 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—The rosin market is slightly easier. Grades of gum rosin used in the paper mills are now quoted at from $4.75 to $4.90 per 280 pounds, in barrels, at works; while wood rosin is selling at $3.90 per 280 pounds, in barrels, at southern shipping points.

SALT CAKE.—Steadiness prevails in the salt cake market. Prices remain unchanged. Salt cake is quoted at from $14 to $14.50; chrome salt cake at from $13.50 to $14 per ton, at works; while imported salt cake is selling at from $14 to $14.50 per ton, on dock.

SODA ASH.—The soda ash market is displaying a strong undertone. Contract shipments are going forward in good volume. Prices remain unchanged. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1.10; in bags, $1.40; and in barrels, $1.50.

STARCH.—Business in the starch market is moderately active. The contract movement is seasonal. Prices are holding to schedule. Special paper making starch is quoted at $2.67 per 100 pounds, in bags; and at $2.95 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—Paper mill demand for sulphate of alumina is well sustained. Prices are holding to schedule. Commercial grades are quoted at from $1.30 to $1.50; while iron free is selling at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market is steady. Sulphur is still quoted at $18 per long ton, on orders of 1,000 tons, or over, on yearly contracts; and at $20 per ton on any smaller quantity over that period. On spot and near by car loads, the quotation is $21 per ton.

TALC.—Conditions in the talc market are fairly satisfactory. Quotations are generally steady to firm. Domestic talc is selling at from $16 to $18 per ton, in bulk, at eastern mines; while imported talc is quoted at from $23 to $30 per ton, on dock.

# Market Quotations

## Paper

(F. o. b. Mill)

| | | | |
|---|---|---|---|
| Ledgers | 6.50 | @ | — |
| Bonds | 6.00 | @ | — |
| Index | 6.00 | @ | — |
| Writings— | | | |
| Extra Superfine | 6.50 | @ | — |
| Superfine | 6.25 | @ | — |
| Tub sized | 5.75 | @ | — |
| Engine sized | 5.50 | @ | — |
| Book, Cased— | | | |
| S. & S. C. | 5.50 | @ | — |
| S. & S. C. Litho. | 5.75 | @ | — |
| M. F. | 5.25 | @ | — |
| Coated and Enamel | 6.15 | @ | 9.30 |
| Coated Litho | 6.90 | @ | — |
| Tissues—Per Ream— | | | |
| White No. 1 | .60 | @ | .80 |
| White No. 2 | .55 | @ | .70 |
| Anti-Tarnish M. G. only | .75 | @ | .80 |
| Colored | .80 | @ | 1.00 |
| Kraft | .75 | @ | .80 |
| Manila | .65 | @ | .70 |
| Manila— | | | |
| No. 1 Jute | 9.00 | @ | 9.25 |
| No. 2 Jute | 7.75 | @ | 8.50 |
| No. 1 Wood | 4.00 | @ | 5.25 |
| No. 2 Wood | 3.50 | @ | 4.00 |
| Butchers | 3.37½ | @ | — |
| Fibre Papers— | | | |
| No. 1 Fibre | 4.25 | @ | 5.50 |
| No. 2 Fibre | 4.00 | @ | 4.75 |
| Common Bogus | 1.50 | @ | 3.00 |
| Screenings | 2.00 | @ | 3.00 |
| Card Middles | 4.00 | @ | 5.00 |
| Glassine— | | | |
| Bleached, basis 25 lbs., No. 1 | .11 | @ | — |
| No. 2 | .10 | @ | — |
| Bleached, basis 20 lbs. | .13 | @ | — |

(Delivered New York)

| | | | |
|---|---|---|---|
| News, per ton— | | | |
| Roll, contract | 40.00 | @ | — |
| Rolls, spot | 40.00 | @ | — |
| Sheets | 45.00 | @ | — |
| Side Runs | 25.00 | @ | — |
| Kraft— | | | |
| No. 1 Domestic | 4.75 | @ | 5.00 |
| No. 2 Domestic | 3.87½ | @ | — |
| Southern | 3.87½ | @ | — |
| Imported | Nominal | | |
| Boards—per ton— | | | |
| News | 45.00 | @ | 50.00 |
| Chip | 42.50 | @ | 47.50 |
| Sgl. Mla. Ll. Chip | 52.50 | @ | 55.00 |
| Jute Lined Chip | 52.50 | @ | 55.00 |
| White Patent Coated | 60.00 | @ | 65.00 |
| Binders Boards | 68.00 | @ | 72.00 |

## Mechanical Pulp

(On Dock, Atlantic Ports)

| | | | |
|---|---|---|---|
| No. 1 Imported— | | | |
| Moist | 27.50 | @ | 29.00 |
| Dry | 30.00 | @ | 31.00 |

(F.o.b. Mill)

| | | | |
|---|---|---|---|
| No. 1 Domestic and Canadian | 22.00 | @ | 28.00 |

## Chemical Pulp

(On Dock, Atlantic Ports)

| | | | |
|---|---|---|---|
| Sulphite (Imported)— | | | |
| Bleached | 2.80 | @ | 3.00 |
| Easy Bleaching | 2.15 | @ | 2.30 |
| No. 1 strong unbleached | 2.15 | @ | 2.30 |
| Mitscherlich Unbleached | 2.15 | @ | 2.35 |
| No. 2 Strong unbleached | 2.00 | @ | 2.05 |
| No. 1 Kraft | 1.75 | @ | 1.90 |
| No. 2 Kraft | 1.60 | @ | 1.70 |
| Sulphate— | | | |
| Bleached | 2.75 | @ | 3.25 |

(F. o. b. Pulp Mill)

| | | | |
|---|---|---|---|
| Sulphite (Domestic and Canadian)— | | | |
| Bleached | 2.50 | @ | 3.75 |
| Easy Bleaching | 2.05 | @ | 2.15 |
| News | 1.90 | @ | 2.00 |
| Mitscherlich unbleached | 2.25 | @ | 2.50 |
| Kraft (Domestic) | 1.60 | @ | 2.75 |
| Soda Bleached | 2.50 | @ | — |

## Domestic Rags

### New Rags

(Prices to Mill f. o. b. N. Y.)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New White, No. 1. | 6.50 | @ | 7.00 |
| Silesias No. 1 | 4.25 | @ | 4.50 |
| New Unbleached | 6.75 | @ | 7.25 |
| New Soft Blacks | 3.00 | @ | 3.25 |
| Blue Overall | 4.00 | @ | 4.25 |
| Fancy | 2.50 | @ | 2.75 |
| Washables | 1.75 | @ | 2.00 |
| Mixed Khaki Cuttings | 3.00 | @ | 3.25 |
| O. D. Khaki Cuttings | 3.75 | @ | 4.00 |
| Men's Corduroy | 1.50 | @ | 1.75 |
| New Mixed Blacks | 2.50 | @ | 2.75 |

### Old Rags

| | | | |
|---|---|---|---|
| White, No. 1— | | | |
| Repacked | 3.00 | @ | 3.50 |
| Miscellaneous | 2.75 | @ | 3.25 |
| White, No. 2— | | | |
| Repacked | 1.75 | @ | 2.25 |
| Miscellaneous | 1.50 | @ | 1.75 |
| Thirds and Blues— | | | |
| Repacked | 1.50 | @ | 1.75 |
| Miscellaneous | 1.25 | @ | 1.50 |
| Black Stockings | 2.50 | @ | 3.00 |
| Roofing Rags— | | | |
| No. 1 | .65 | @ | .70 |
| No. 2 | .50 | @ | .60 |
| No. 3 | .40 | @ | .50 |
| No. 4 | .35 | @ | .40 |
| No. 5A | .30 | @ | .35 |

## Foreign Rags

### New Rags

| | | | |
|---|---|---|---|
| New Dark Cuttings | 1.50 | @ | 1.60 |
| New Mixed Cuttings | 1.60 | @ | 1.70 |
| New Light Silesias | 3.50 | @ | 3.75 |
| Light Flannelettes | 3.25 | @ | 3.50 |
| Unbleached Cuttings | 5.75 | @ | 6.00 |
| New White Cuttings | 5.50 | @ | 6.00 |
| New Light Oxfords | 3.25 | @ | 3.50 |
| New Light Prints | 2.75 | @ | 3.00 |

### Old Rags

| | | | |
|---|---|---|---|
| No. 1 White Linens | 7.50 | @ | 8.00 |
| No. 2 White Linens | 6.50 | @ | 7.00 |
| No. 3 White Linens | 4.50 | @ | 5.00 |
| No. 4 White Linens | 2.25 | @ | 2.50 |
| No. 1 White Cotton | 3.75 | @ | 4.00 |
| No. 2 White Cotton | 3.00 | @ | 3.25 |
| No. 3 White Cotton | 2.50 | @ | 2.75 |
| No. 4 White Cotton | 1.60 | @ | 1.75 |
| Extra Light Prints | 2.00 | @ | 2.25 |
| Ord. Light Prints | 1.75 | @ | 1.85 |
| Med. Light Prints | 1.55 | @ | 1.65 |
| Dutch Blue Cottons | 1.65 | @ | 1.80 |
| French Blue Linens | 2.10 | @ | 2.25 |
| German Blue Linens | 1.85 | @ | 2.00 |
| German Blue Cottons | 1.50 | @ | 1.60 |
| Checks and Blues | 1.30 | @ | 1.40 |
| Lindsay Garments | 1.10 | @ | 1.15 |
| Dark Cottons | 1.00 | @ | 1.10 |
| Old Shopperies | .85 | @ | .90 |
| New Shopperies | .80 | @ | .85 |
| French Blues | 1.50 | @ | 1.65 |

## Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

| | | | |
|---|---|---|---|
| Gunny No. 1— | | | |
| Foreign | 1.30 | @ | 1.40 |
| Domestic | 1.25 | @ | 1.35 |
| Wool Tares, light | 1.05 | @ | 1.15 |
| Wool Tares, heavy | 1.05 | @ | 1.15 |
| Bright Bagging | 1.00 | @ | 1.10 |
| Manila Rope— | | | |
| Foreign | 2.50 | @ | 2.75 |
| Domestic | 2.50 | @ | 2.75 |
| Small Mixed Rope | 1.10 | @ | 1.35 |
| New Burlap Cut | 1.50 | @ | 1.75 |
| Hessian Jute Threads— | | | |
| Foreign | 2.60 | @ | 2.75 |
| Domestic | 2.80 | @ | 3.00 |

## Old Waste Papers

(F. o. b. New York)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| White Envelope Cuttings | 2.50 | @ | 2.60 |
| Ordinary Hard White No. 1 | 2.20 | @ | 2.30 |
| Hard White No. 2 | 2.00 | @ | 2.10 |
| Soft White No. 1 | 1.85 | @ | 1.95 |
| Flat Stock— | | | |
| Stitchless | .80 | @ | .90 |
| Overissue Mag | .80 | @ | .90 |
| Solid Flat Book | .65 | @ | .75 |
| Crumpled No. 1 | .50 | @ | .60 |
| Solid Book Ledger | 1.50 | @ | 1.65 |
| Ledger Stock | .95 | @ | 1.05 |
| New B. B. Chips | .30 | @ | .35 |
| Manilas— | | | |
| New Env. Cut | 1.55 | @ | 1.65 |
| New Cuttings | 1.10 | @ | 1.20 |
| Extra No. 1 old | .75 | @ | .85 |
| Print | Nominal | | |
| Bogus Wrapper | .40 | @ | .50 |
| Container | Nominal | | |
| Old Kraft Machine— | | | |
| Compressed bales | 1.10 | @ | 1.20 |
| News— | | | |
| No. 1 White News | 1.25 | @ | 1.30 |
| Strictly Overissue | .55 | @ | .60 |
| Strictly Folded | .35 | @ | .40 |
| No. 1 Mixed Paper | .23 | @ | .28 |

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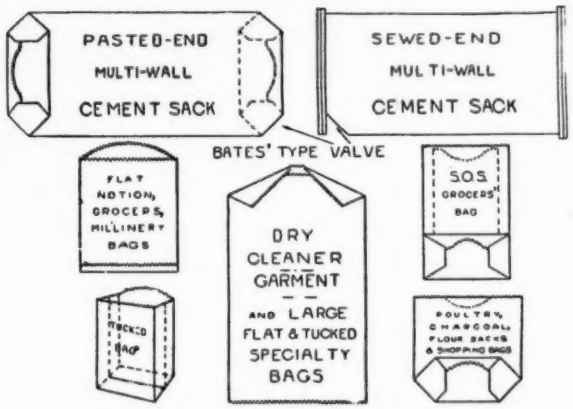
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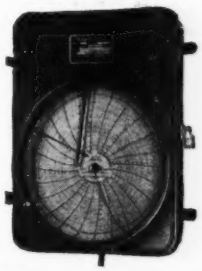

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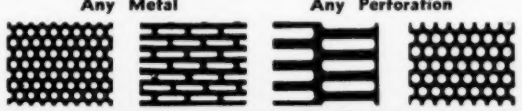

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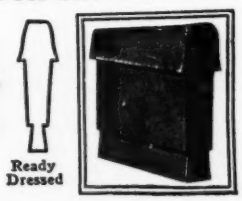


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### Twines
(F. o. b. Mill)

| | | | |
|---|---|---|---|
| **Cotton—** | | | |
| B. C. 18 basis | .30 | @ | .32 |
| No. 1 | .20 | @ | .22 |
| No. 2 | .19 | @ | .20 |
| No. 3 | .17 | @ | .18 |
| A. Italian, 18 basis | .36 | @ | .37 |
| **Finished Jute—** | | | |
| Dark, 18 basis | .18 | @ | .20 |
| Light, 18 basis | .20 | @ | .22 |
| **Jute Wrapping, 3-6 Ply—** | | | |
| No. 1 | .15½ | @ | .16½ |
| No. 2 | .15 | @ | .16 |
| **Tube Rope—** | | | |
| 4-ply and larger | .09¾ | @ | .09¾ |
| Fine Tube Rope— | | | |
| 4-ply | .11¾ | @ | .11¾ |
| 3-ply | .14¾ | @ | .14¾ |
| 2-ply | .14¾ | @ | .14¾ |
| Paper Makers Twine | .08¾ | @ | .13¾ |
| Box Twine, 2-3 ply | .14¾ | @ | .14¾ |
| White Hemp | .13¾ | @ | .16¾ |
| **Java Sisal—** | | | |
| No. 1 Basis | .11½ | @ | — |
| No. 2 Basis | .10½ | @ | — |
| New Zealand Sisal | .11½ | @ | — |
| **Sisal Lath Yarn—** | | | |
| No. 1 | .13½ | @ | .15½ |
| No. 2 | .11½ | @ | .13½ |
| Manila Twine | .24½ | @ | .29½ |

## CHICAGO

### Paper
(F. o. b. Mill)

| | | | |
|---|---|---|---|
| Rag Bond | .16 | @ | .50 |
| Water Marked Sulphite Bond | .07½ | @ | .12 |
| Duplicate Bond | .09 | @ | .11 |
| Superfine Writing | .18 | @ | .24 |
| No. 1 M. F. Book | .06½ | @ | .07¼ |
| No. 2 M. F. Book | .05¼ | @ | .06¼ |
| No. 1 S.&S.C. Book | .06¼ | @ | .07¼ |
| No. 2 S.&S.C. Book | .05¼ | @ | .06½ |
| Coated Book | .07 | @ | .12 |
| Coated Label | .07 | @ | .08½ |
| No. 1 Manila | .04¼ | @ | .05¼ |
| No. 1 Fibre | .04¼ | @ | .05¼ |
| No. 2 Manila | .04¼ | @ | .04¾ |
| Butcher's Manila | .03¼ | @ | .03¾ |
| No. 1 Kraft | 4.75 | @ | 5.00 |
| Southern Kraft | 3.88 | @ | 4.25 |
| No. 2 Kraft | 3.88 | @ | 4.25 |
| Wood Pulp Boards | .04¼ | @ | .04¾ |
| Sulphite Screenings | .03 | @ | .03¼ |
| Manila Tissue | .05¾ | @ | .07 |
| White Tissue | .07 | @ | .09 |

(Delivered Central Territory)

| | | | |
|---|---|---|---|
| News, per ton— | | | |
| Rolls, contract | 41.00 | @ | — |
| Sheets, open | 46.00 | @ | 51.00 |
| **Boards, per ton—** | | | |
| Plain Chip | 37.50 | @ | — |
| Solid News | 43.50 | @ | — |
| Manila Lined Chip | 47.50 | @ | — |
| Patent coated | 55.00 | @ | — |
| **Container Lined—** | | | |
| 85 Test | 60.00 | @ | 65.00 |
| 100 Test | 60.00 | @ | 70.00 |

### Old Papers
(F. o. b. Chicago)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 White Envelope cuttings | 1.70 | @ | 1.80 |
| No. 1 Hard White | 1.40 | @ | 1.50 |
| No. 1 Soft White | 1.20 | @ | 1.30 |
| Ledger & Writings | .70 | @ | .80 |
| Solid Books | .60 | @ | .70 |
| Blanks | 1.00 | @ | 1.05 |
| Kraffs | .80 | @ | .90 |
| New Kraft Cuts | 1.20 | @ | 1.30 |
| Manila Env. Cuts | 1.25 | @ | 1.30 |
| Ex. No. 1 Manila | .90 | @ | 1.00 |
| Print Manila | .50 | @ | .55 |
| Overissue News | .60 | @ | .70 |
| Old Newspapers— | | | |
| No. 1 | .55 | @ | .60 |
| Mixed Papers— | | | |
| No. 1 | .30 | @ | .40 |
| Roofing Stocks— | | | |
| No. 1 | 30.00 | @ | — |
| No. 2 | 28.00 | @ | — |

## PHILADELPHIA

### Paper
(F. o. b. Mill)

| | | | |
|---|---|---|---|
| Bonds | .04 | @ | .40 |
| Ledgers | .06 | @ | .40 |
| Writings— | | | |
| Superfine | .10 | @ | .18 |
| Extra Fine | .15 | @ | .26 |
| Fine | .15 | @ | .26 |
| Fine, No. 2 | .10 | @ | .25 |
| Fine No. 3 | .05½ | @ | .18 |
| Book, M. F. | .04¾ | @ | .07 |
| Book, S. S. & C. | .05 | @ | .07½ |
| Book, Coated | .06 | @ | .16 |
| Coated Lithograph | .06 | @ | .11 |
| Label | .07 | @ | .11 |
| No. 1 Jute Manila | .06 | @ | .10 |
| Manila Sul., No. 1 | .03 | @ | .06 |
| Manila No. 2 | .03 | @ | .05 |
| No. 1 Kraft | .05¼ | @ | .06½ |
| No. 2 Kraft | .03¾ | @ | .05 |
| Southern Kraft | 2.75 | @ | 4.00 |
| Common Bogus | .03 | @ | .04½ |

(Delivered Philadelphia)

| | | | |
|---|---|---|---|
| News Print Rolls | 46.00 | @ | 55.00 |
| Straw Board | 40.00 | @ | 45.00 |
| News Board | 50.00 | @ | — |
| Chip Board | 45.00 | @ | — |
| Wood Pulp Board | 70.00 | @ | 85.00 |
| Binder Boards— | | | |
| No. 1, per ton | 75.00 | @ | 80.00 |
| No. 2, per ton | 70.00 | @ | 75.00 |
| Carload lots | 65.00 | @ | 70.00 |
| Tarred Felts— | | | |
| Regular | 52.25 | @ | 54.25 |
| Slaters (per roll) | .84 | @ | .94 |
| Best Tarred, 1-ply (per roll) | 1.95 | @ | 2.10 |
| Best Tarred, 2-ply (per roll) | 1.50 | @ | 1.60 |
| Best Tarred, 3-ply | 2.00 | @ | 2.25 |

### Domestic Rags (New)
(Price to Mill, f. o. b. Phila.)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New White, No. 1 | .03½ | @ | .04 |
| New White, No. 2 | .02½ | @ | .04 |
| Light Silesias | .02½ | @ | .03 |
| Silesias, No. 1 | .03 | @ | .03½ |
| Black Silesias, soft | .02½ | @ | .03 |
| New Unbleached | .05 | @ | .05½ |
| Washable, No. 1 | .01½ | @ | .02 |
| Blue Overall | .03½ | @ | .04 |
| Cottons—According to grades— | | | |
| Washable, No. 2 | .02½ | @ | .03 |
| New Blue | .01½ | @ | .03 |
| Fancy | .01½ | @ | .03 |
| New Black Soft | .02 | @ | .04 |
| New Light Seconds | .01½ | @ | .02 |
| New Dark Seconds | 1.50 | @ | 1.75 |
| Khaki Cuttings— | | | |
| No. 1 O.D. | .03 | @ | .04 |
| No. 2 Mixed | .03 | @ | .04 |
| Corduroy | .02 | @ | .03 |
| New Canvas | .03½ | @ | .04½ |
| New Black Mixed | .02½ | @ | .03½ |

### Domestic Rags (Old)

| | | | |
|---|---|---|---|
| White No. 1— | | | |
| Repacked | 2.50 | @ | 3.50 |
| Miscellaneous | 1.75 | @ | 2.25 |
| M. G. | 3.00 | @ | 3.75 |
| Thirds and Blues— | | | |
| Miscellaneous | 1.00 | @ | 1.50 |
| Repacked | 1.50 | @ | 2.00 |
| Black Stockings (Export) | 2.00 | @ | 3.50 |
| Roofing Stock— | | | |
| Foreign No. 1 | .50 | @ | .75 |
| Repacked | .70 | @ | .85 |

### Bagging
(F. o. b. Phila.)

| | | | |
|---|---|---|---|
| Gunny, No. 1— | | | |
| Foreign | 1.25 | @ | 1.50 |
| Domestic | 1.50 | @ | 1.75 |
| Manila Rope | 2.00 | @ | 2.25 |
| Sisal Rope | 1.25 | @ | 1.50 |
| Mixed Rope | 1.00 | @ | 1.10 |
| Scrap Burlaps— | | | |
| No. 1 | 1.25 | @ | 1.50 |
| No. 2 | .80 | @ | 1.00 |
| Wool Tares, heavy | 2.75 | @ | — |
| Mixed Strings | 1.15 | @ | 1.25 |
| No. 1 New Light Burlap | 2.25 | @ | 2.50 |
| New Burlap Cuttings | 2.00 | @ | 2.25 |

### Old Papers
(F. o. b. Phila.)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 Hard White | 2.25 | @ | 2.30 |
| No. 2 Hard White | 2.00 | @ | 2.10 |
| No. 1 Soft White | 2.05 | @ | 2.10 |
| No. 2 Soft White | 1.15 | @ | 1.25 |
| No. 1 Mixed | .95 | @ | 1.00 |
| No. 2 Mixed | .75 | @ | .80 |
| Solid Ledger Stock | 1.50 | @ | 1.60 |
| Writing Paper | 1.05 | @ | 1.10 |
| No. 1 Books, heavy | .80 | @ | .90 |
| No. 2 Books, light | .70 | @ | .80 |
| No. 1 New Manila | 1.20 | @ | 1.50 |
| No. 1 Old Manila | .85 | @ | .90 |
| Print Manila | .75 | @ | .80 |
| Container Manila | .60 | @ | .65 |
| Old Kraft | .90 | @ | 1.05 |
| Common Paper | .35 | @ | .40 |
| No. 1 Mixed Paper | .35 | @ | .40 |
| Straw Board Chip | .35 | @ | .40 |
| Binders Board Chip | .35 | @ | .40 |
| Corrugated Board | .50 | @ | .60 |
| Overissue News | .55 | @ | .60 |
| Old Newspapers | .40 | @ | .50 |

## BOSTON

### Paper
(F. o. b. Mill)

| | | | |
|---|---|---|---|
| **Ledgers—** | | | |
| Sulphite | .06 | @ | .12½ |
| Rag Content | .12 | @ | .30 |
| All Rag | .36 | @ | .52½ |
| **Bonds—** | | | |
| Sulphite | .05¾ | @ | .11 |
| Rag Content | .12 | @ | .30 |
| All Rag | .36 | @ | .65 |
| **Writings** | .06½ | @ | .20 |
| Superfines | .11 | @ | .31 |
| **Book, Super** | .06 | @ | .09 |
| **Book, M. F.** | .05½ | @ | .08½ |
| **Book, Coated** | .08½ | @ | .18 |
| **Coated Litho** | .09 | @ | .12 |
| **Label** | .09½ | @ | .15 |
| **Jute Manila No. 1** | .11 | @ | .13 |
| **Manila, Sul. No. 1** | .04¾ | @ | .06½ |
| **Manila, Sul. No. 2** | .03¾ | @ | .04½ |
| **No. 1 Kraft** | .04¾ | @ | .05 |
| **No. 2 Kraft** | .03½ | @ | .04½ |
| (F. o. b. Boston) | | | |
| **Southern Kraft** | .03¾ | @ | .04½ |
| (F. o. b. destination in carload lots, f. o. b. mill in less than carload lots.) | | | |
| **Common Bogus** | .02 | @ | .02¼ |
| (Delivered New England points) | | | |
| **News Print, rolls** | 44.50 | @ | — |
| **Straw Board, rolls** | .009 | — | 35.00 |
| **Straw Board in Sheets, basis 35s to 70s** | — | @ | 40.00 |
| **Filled News Board** | 45.00 | @ | 50.00 |
| **Chip Board** | 42.50 | @ | 47.00 |
| **Chip Board (Creasing)** | 45.00 | @ | — |
| **Single Manila Lined Chip** | 52.50 | @ | 62.50 |
| **Single White, Patent Coated News Board—Bender** | 62.50 | @ | 72.50 |
| **Wood Pulp Board** | 70.00 | @ | 75.00 |
| **Binder Boards** | 62.00 | @ | 75.00 |

### Old Papers
(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 Hard White | 2.40 | @ | — |
| No. 1 Soft White | 1.75 | @ | 2.00 |
| No. 1 Mixed | .80 | @ | .90 |
| No. 2 Mixed | .75 | @ | .80 |
| Solid Ledger Books | 1.40 | @ | 1.50 |
| Overissue Ledger Stock | 1.15 | @ | 1.30 |
| Mixed Ledgers | 1.00 | @ | 1.10 |
| No. 1 Books, heavy | .85 | @ | .95 |
| No. 1 Books, light | .65 | @ | .75 |
| Crumpled Stitchless Book Stock | .50 | @ | .60 |
| Manila Env. Cuttings | 1.25 | @ | 1.30 |
| No. 1 Old Manila | .95 | @ | 1.05 |
| White Blank News | 1.15 | @ | 1.25 |
| No. 1 Kraft | — | @ | 1.00 |
| Manila | .75 | @ | .80 |
| No. 1 Mixed Papers | .20 | @ | .25 |
| Print Manila | .45 | @ | .50 |
| Overissue News | .55 | @ | .60 |
| Old Newspapers | .37½ | @ | .42½ |
| Box Board Chips | .32½ | @ | .35 |
| Corrugated Boxes | .27½ | @ | .35 |
| Screening Wrappers | .60 | @ | .70 |

### Bagging
(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Manila Rope— | | | |
| Foreign | 2.50 | @ | — |
| Domestic | — | @ | 2.50 |
| Transmission Rope | 1.60 | @ | — |
| Mixed Strings | — | @ | .60 |
| Jute Rope | 1.15 | @ | 1.35 |
| Jute Carpet Threads | .65 | @ | .70 |
| Gunny No. 1— | | | |
| Foreign | 1.50 | @ | 1.60 |
| Domestic | 1.00 | @ | 1.10 |
| Bleachery Burlap | 3.00 | @ | 3.25 |
| No. 1 Scrap Burlap | 1.40 | @ | — |
| Scrap Sisal | 1.25 | @ | 1.35 |
| Scrap Sisal for shredding | 1.25 | @ | 1.35 |
| Wool Tares, heavy | — | @ | 1.05 |
| New Burlap Cuttings | 1.15 | @ | 1.25 |
| Australian Wool Pouches | 2.25 | @ | 2.50 |
| Heavy Baling Bagging | 1.40 | @ | 1.50 |
| Paper Mill Bagging | — | @ | .75 |
| Bagging No. 2 | .50 | @ | .60 |

### Domestic Rags (New)
(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New Light Prints | .02 | @ | .02¼ |
| New White No. 1 | .06½ | @ | — |
| New White No. 2 | .04½ | @ | .05 |
| Silesias No. 1 | .04 | @ | — |
| New Black Silesias | .02½ | @ | .03 |
| New Unbleached | .07 | @ | .07¼ |
| Blue Cheviot | — | @ | 4.65 |
| Fancy | — | @ | .02¼ |
| Washable | .02¼ | @ | — |
| Cottons—According to grades— | | | |
| Blue Overalls | — | @ | .03¼ |
| New Black, soft | .04 | @ | .04½ |
| Khaki Cuttings | .03 | @ | .03¼ |
| O. D. Khaki | .03 | @ | .03¼ |
| Corduroy | .01¾ | @ | .02 |
| New Canvas | — | @ | .05 |
| B.V.D. Cuttings | — | @ | .06¼ |

### Domestic Rags (Old)
(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Canvas | .04½ | @ | — |
| White No. 1— | | | |
| Repacked | 3.00 | @ | 3.50 |
| Miscellaneous | 2.00 | @ | 2.25 |
| White No. 2— | | | |
| Repacked | .01½ | @ | .01¾ |
| Miscellaneous | .01½ | @ | .01¾ |
| Twos and Blues | 1.25 | @ | 1.50 |
| Thirds and Blues | | | |
| Repacked | 1.10 | @ | 1.25 |
| Miscellaneous | .85 | @ | .90 |
| Black Stockings | 2.25 | @ | 2.50 |
| Roofing Stock— | | | |
| No. 1 | .60 | @ | .65 |
| No. 2 | .55 | @ | .60 |
| No. 3 | .35 | @ | .45 |

### Foreign Rags
(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Dark Cottons | 1.10 | @ | — |
| New White Shirt Cuttings | 5.50 | @ | 6.00 |
| Dutch Blues | 2.00 | @ | 2.50 |
| New Checks & Blues | 2.50 | @ | 3.00 |
| Old Fustians | 1.55 | @ | 1.60 |
| Old Linsey Garments | — | @ | 1.10 |

## TORONTO

### Paper
(F. o. b. Mill)

| | | | |
|---|---|---|---|
| **Bond—** | | | |
| No. 1 Sulphite | .09¾ | @ | — |
| No. 2 Sulphite | .08 | @ | — |
| No. 1 Colored | .10¾ | @ | — |
| No. 2 Colored | .08½ | @ | .10½ |
| **Ledgers (sulphite)** | | | |
| Ledgers, No. 1 | .34½ | @ | — |
| Ledgers, No. 2 | .25½ | @ | — |
| **Writing** | .09 | @ | .09½ |
| **Book—** | | | |
| No. 1 M. F. (Carloads) | 6.20 | @ | — |
| No. 3 M. F. (Carloads) | 5.70 | @ | — |
| No. 4 M. F. (carloads) | 4.75 | @ | — |
| No. 1 S. C. (carloads) | 6.65 | @ | — |
| No. 3 S. C. (carloads) | 6.20 | @ | — |
| No. 4 S. C. (carloads) | 5.20 | @ | — |
| No. 1 Coated and Litho | 12.00 | @ | — |
| No. 2 Coated and Litho | 10.50 | @ | — |
| No. 3 Coated and Litho | 9.50 | @ | — |
| Coated tinted | 14.00 | @ | — |
| **Wrapping—** | | | |
| Rag Brown | 4.25 | @ | — |
| White Wrap | 2.22½ | @ | — |
| "B" Manila | 4.75 | @ | — |
| No. 1 Manila | 5.25 | @ | — |
| Fiber | 5.25 | @ | — |
| Kraft, M. F. | 5.75 | @ | — |
| Kraft No. 2 | 5.25 | @ | — |

(F.O.B. Cars Toronto)

| | | | |
|---|---|---|---|
| News, per ton— | | | |
| Rolls (contract) | 45.50 | @ | — |
| Sheets | 50.50 | @ | — |

### Pulp
(F. o. b. Mill)

| | | | |
|---|---|---|---|
| Ground Wood | 18.00 | @ | 20.00 |
| Sulphite easy bleaching | 40.00 | @ | — |
| Sulphite, news grade | 38.00 | @ | — |
| Sulphite, bleached | 50.00 | @ | 55.00 |
| Sulphate | 50.00 | @ | — |

### Old Waste Paper
(In carload lots, f. o. b. Toronto)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| White Env. Cut | 2.00 | @ | 2.10 |
| Soft White | 1.60 | @ | 1.90 |
| White Blk. News | 1.25 | @ | 1.50 |
| Book and Ledger— | | | |
| Flat Magazine and Book Stock (old) | .90 | @ | 1.00 |
| Light and Crumpled Book Stock | .80 | @ | .90 |
| Ledgers and Writings | 1.00 | @ | 1.05 |
| Manilas— | | | |
| New Manila Cut | 1.25 | @ | 1.50 |
| Printed Manilas | .70 | @ | — |
| Kraft | 1.25 | @ | 1.50 |
| News and Scrap— | | | |
| Strictly Overissue | 1.00 | @ | — |
| Strictly Folded | .70 | @ | — |
| No. 1 Mixed Paper | .60 | @ | — |

### Domestic Rags
(Price to mills, f. o. b. Toronto)

| | | | |
|---|---|---|---|
| No. 1 White Shirt Cuttings | .05¼ | @ | .05½ |
| Fancy Shirt Cuttings | .02¼ | @ | .02½ |